



Lost Person Behavior



Instructor Activity Guide

Robert J. Koester



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dbS Productions
Charlottesville, Virginia

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Author

Robert J. Koester first joined the Appalachian Search & Rescue Conference in 1981 and since then has participated in hundreds of searches. He holds a Master of Science degree in biology (neurobiology) from the University of Virginia. His contributions to search and rescue include seminal research on lost person behavior (with emphasis on dementia) and the International Search and Rescue Incident Database (ISRID). A type 1 incident commander, instructor for the Virginia Department of Emergency Management, and past-president of the Virginia Search and Rescue Council, Robert has also worked for the United States Coast Guard, National Aeronautics and Space Administration, National Park Service, and Federal Emergency Management Agency. Author of numerous books and articles on search rescue he has presented in Australia, Canada, Iceland, New Zealand, the United Kingdom, and throughout the United States.

Contributors and Reviewers

Preface

This collection of map problems and activities started as an activity guide to the Lost Person Behavior class. The goal of the course is simple – help locate missing search subjects faster. The faster they are found, the smaller the number of resources needed and most important of all, the better the chances of being found alive. Looking in the right place is the cornerstone to every successful operation. This overall goal is not unique to just the Lost Person Behavior class. While each exercise has a specific objective relevant to the overall course, the exercises can also be used outside of the Lost Person Behavior class. Instructors are always looking for new map problems and instructional aids. This book provides 34 different activities designed to improve everyone’s ability to determine the right place to look.

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Plan of Instruction

COURSE GOAL

The goal of the course is to provide participants with the tools and knowledge necessary to successfully look in the right place, understand lost person behavior, apply statistical tables, identify needed special investigation, and deploy resources into the field. Participants should also be able to brief other searchers on key components of lost person behavior.

COURSE OBJECTIVES

Upon successfully completing this course, the participants will be able to:

- Describe key developments in the field of lost person behavior. (Unit 1)
- Describe how the ISRID database is organized to best predict behavior. (Unit 2)
- Demonstrate the ability to determine correct subject category given an actual incident scenario. (Unit 2)
- Judge different methods to combine different subject categories. (Unit 2)
- Explain different causes of becoming lost and different strategies lost persons attempt. (Unit 3)
- Demonstrate ability to identify decision points given a map and a lost person scenario. (Unit 3).
- Describe key components and common misconceptions of lost person behavior. (Unit 4)
- Use the correct statistical summary data from the ISRID database to best model a subject's possible location and survivability. (Unit 5)
- Demonstrate the use of reflex tasking to generate initial tasks given a map and a scenario. (Unit 6)
- Describe key points for each subject category profile. (Unit 7)
- Demonstrate the ability to deploy resources appropriate for each subject category given a map and scenario information. (Unit 7).

TARGET AUDIENCE

The target audience for this course is as follows:

PRIMARY AUDIENCE	SECONDARY AUDIENCE
Search and Rescue (SAR) Management	Public Safety Officials
Search and Rescue (SAR) Field personnel	Public Safety Responders
Law Enforcement personnel	Parks and Recreations participants
First Responders	Education and Academic participants

The lost person behavior course has no prerequisites. Those with a search and rescue background will get the maximum benefit from the course.

COURSE LIMITATIONS:

This course is not intended to replace or be in lieu of any search management course. While it provides effective tools to aid in determining where to look and provides initial tactics, several critical search management concepts and theory are not addressed in this training. The actual methods to task teams using the correct tactics are not covered. In addition, critical concepts not addressed include but are not limited to; pre-planning, SAR resources, resource management, management systems, legal issues, risk assessment, search urgency, strategy, formal search theory, consensus methods, clue management, incident action plans, documentation, search suspension, etc.

COURSE STRUCTURE/STRATEGY

All participants will be prepared for an environment of interactive lectures, class participation, giving mini-presentations, and working independently or in groups to complete activities. Participants will be encouraged to apply their existing search and rescue skills and knowledge as well as those newly acquired in challenging and dynamic scenarios. Each unit will have a lecture portion, and discussion opportunities, accompanied by group activities to highlight, expand, and practice the teaching points of the course.

An important part of this course will be the organization of students into small groups of two to four people. This will ensure the maximum participation in the group discussions and activities. Course instructors will help facilitate group activities and discussions. These activities include opportunities for mentoring,

providing immediate feedback and ensuring that group activities are performed as specified in the course objectives.

Students will be required to demonstrate their acquisition of the skills and knowledge through activities revolving around a given search scenario. Throughout the course, students will be given various search scenarios.

DURATION

This course is designed for either a 1-day format requiring 7 student hours or a two-day format requiring 14 student hours. This time includes lecture, group activities, breaks, and the end-of-course exam. It does not include the lunch break. The course may be delivered all at once, or broken up into units and delivered over a longer period of time.

If the map problems are being used as a stand alone training component the time period will be variable and no course certification will be offered.

Course Delivery

The course will be delivered as a one or two day workshop. Some instructors may also elect to teach the course in hour long blocks of time over an extended time.

The course is designed to meet the requirements of the International Association for Continuing Education & Training (IACET) standard (ANSI/IACET 1-2007 Standard). The one-day class will award 0.7 CEU and the two-day class will award 1.4 CEU provided the course is not shortened and meets all other requirements. Awarding of CEU from dbS Productions has additional requirements and costs. Awarding CEU is dependent upon several factors such as qualified instructors, following the plan of instruction, proper documentation of the student's attendance, and successful completion of the learning objectives.

INSTRUCTOR/FACILITATOR QUALIFICATIONS

For field offerings the course will be managed by a Lead Instructor who is responsible for scheduling and managing the overall course delivery.

This course is designed for delivery by dbS Productions Certified Instructors who have search and rescue experience, search management experience, proven instructional experience, have successfully completed a Lost Person Behavior (LPB) workshop, and have successfully completed a Lost Person Behavior Train-The-Trainer workshop. Experienced search and rescue trainers may also deliver

specific sections of instruction in their sphere of competence should the need arise. **Only certified instructors may deliver the Lost Person Behavior course.** Any instruction may use the map exercises as a standalone.

It is recommended that a Lead Instructor be selected from the pool of instructors.

The Lead Instructor should be able to:

- Assist the dbS Productions course manager with resident or offsite deliveries.
- Provide the class prompt feedback on subject matter issue resolutions (parking lot issues)
- Serve as a map problem leader during group activities
- Facilitate discussion of subject issues arising among the instructor group
- Facilitate discussion of the exams and resolve any exam issues relating to the accuracy of the content
- Establish a contact with dbS Productions to discuss any factual or content issues.

Instructors will ensure that they:

- Are familiar with all course materials
- Have a copy of the course agenda
- Update their unit examples to remain timely
- Are current with their instructional skills

OVERVIEW OF COURSE UNITS AND EVALUATION

📖 Unit 1: Introduction This section provides information about the course location, the course's organizational structure, the instructors and participants. An overview of previous lost person behavior research is presented. A pretest will be given. The pretest explores both the participant's factual knowledge and ability to work a map problem.

📖 Unit 2: International SAR Incident Database (ISRID) provides participants an overview of the basic organization of the ISRID database. This allows the participant to use the correct statistical tables in order to best predict the behavior of a missing subject. The criterion for placing a missing subject into a subject category is shown. Participants are given two different actual scenarios to demonstrate the ability to correctly determine the correct subject category. Overall findings from the ISRID database regarding survivability and survivability factors are also shown.

📖 Unit 3: Lost Person Strategies provides participants information about the definition of lost, different scenarios that may cause a subject to become missing, and different strategies lost persons use when lost. Several scenarios are then presented which allow the participants to discuss the correct definition of lost and determine the appropriate scenario. The concept of decision points is introduced. Decision points are then illustrated with maps and photographs. Participants are then given several map problems that illustrate different strategies used by lost subjects. In the final section, participants working in groups must demonstrate the ability to identify decision points given a map and a lost person scenario.

📖 Unit 4: Myths and Legends: The instructor will discuss several common misconceptions about lost person behavior and statistical concepts. Topics include turning behaviors, uphill versus downhill, practical implications of statistical concepts, affects of climate on behavior, and computer modeling. At the end of this lesson, participants will be able to score the pre-test.

📖 Unit 5: ISRID Tables explained provides an overview of the statistical tables and models used in the ISRID database. The instructor will discuss with participants how the book Lost Person Behavior is organized. Then each of the predictive models (ring model, dispersion angle, elevation model, track offset model, mobility model, and feature model) will be demonstrated. The instructor will lead a discussion on how the different models may be integrated while planning. The models will be put into context with the current method of determining probability of containment (or probability of area) which is the Mattson methods. The instructor will also demonstrate the survivability statistics. Participants given a scenario will use the textbook to determine the subject's statistical location and potential survivability.

📖 Unit 6: Reflex Tasking The instructor will present the key components of reflex tasking using the bike model to organize basic types of tactical operations. Participants working in groups will then demonstrate the use of reflex tasking to generate initial tasks given a map and scenario information.

📖 Unit 7: Subject Categories: The instructor will present key concepts and highlights from each selected subject category. The instructor will tailor the presentation to meet the needs of participants based upon any regional differences. Instructor will foster class discussion by encouraging presentation of relevant cases from the local area. Instructor may also substitute map problems presented in the course with local map problems that demonstrate the same key concepts of lost person behavior. Participants should be able to use the textbook to determine the definition of each category, what types of activities or conditions included in each category, key profile points, the selection of relevant statistics, appropriate reflex tasks, and detailed investigation questions needed for each subject category. Several map problems are presented so that the participants can demonstrate the ability to deploy resources appropriate for each subject category given a map and scenario information. Potential subject categories to cover include; Abduction, Aircraft, Angler, ATV, Autistic, Camper, Caver, Child, Climber, Dementia, Despondent, Gatherer, Hiker, Horseback Rider, Hunter, Mental Illness, Mental Retardation, Mountain Biker, Other, Runner, Skier, Snowboarder, Snow-Mobiler, Snowshoer, Substance Abuse, Vehicle, Water, and Worker. The unit will be summarized with a brief discussion of the importance of collecting data.

SCHEDULE

A sample agenda is provided to assist the Course Manager or Lead Instructor to prepare for delivery of the two-day version of the course.

Two-Day Agenda

Day 1

1. Welcome and Opening	09:00 – 10:00
2. International SAR Incident Database (ISRID)	10:15 – 11:00
3. Lost Person Strategies	11:15 – 12:15
<i>Lunch</i>	12:15 – 13:15
4. Myths and Legends	13:15 – 14:15
5. ISRID Tables explained	14:30 – 15:15
6. Reflex Tasking	15:30 – 17:30

Day 2

Subject Categories Abduction, Aircraft, Angler, ATV, Autistic, Camper, Caver, Child, Climber, Dementia, Despondent, Gatherer, Hiker, Horseback Rider, Hunter, Mental Illness, Mental Retardation, Mountain Biker, Other, Runner, Skier, Snowboarder, Snow-Mobiler, Snowshoer, Substance Abuse, Vehicle, Water, Worker	08:30 – 18:00
<i>Lunch</i>	12:00 – 13:00
Subject Categories continued	13:00 – 18:00

ONE DAY AGENDA

Day 1

1. Welcome and Opening	08:30 – 9:15
2. International SAR Incident Database (ISRID)	9:15 – 11:00
3. Lost Person Strategies	10:00 – 11:00
4. Myths and Legends	11:00 – 12:00
Lunch	12:00 – 13:00
5. ISRID Tables explained	13:00 – 13:45
6. Reflex Tasking	13:45 – 14:45
7. Subject Categories	14:45 – 17:00

COURSE REFERENCES

The materials listed below are used in this course.

- *Lost Person Behavior* by Robert J. Koester*
- *Lost Person Behavior: Instructor Activity Guide*
- *Urban Search* by Chris Young and John Wehbring
- *Search Wheel*
- *Lost Person Behavior Student Workbook**
- Course Handouts
 - Map problems (if not included in student workbook)
 - Course administration (Agenda, class rooster)
 - Student Evaluation Forms (one set per group instructor)

Note that for each offering, instructors must review current dbS Production publications to ensure that students are receiving the most recent version of the referenced documents.

*Each student is required to already have, purchase, or be given a copy of *Lost Person Behavior* and the student workbook as a key element of the instructor – dbS Productions presentation license agreement. If using this book as a stand-alone for map problems only the presentation license agreement does not require the purchase of *Lost Person Behavior*. However, it is highly recommended.

SUPPORTING PUBLICATIONS

The following publications are suggested to augment the delivery of this course.

- *Analysis of Lost Person Behavior* by William Syrotuck
- *Lost Person Behaviour* by Ken Hill
- *Lost Alzheimer's Disease Search Management* by Robert J. Koester

SPACE REQUIREMENTS

The following space requirements are recommended:

- Primary Room for Instruction
 - Room Dimensions – for class of 25-30 students, minimum 25 ft. x 50 ft., or similar capacity
 - Five to six tables, seating five to six people per table. Minimum table dimensions to accommodate students, instructors and course materials (manuals) 6 ft. x 8 ft.
 - Instructor table to accommodate assigned instructors, minimum one
 - Additional tables for additional materials and supplies, visual equipment (projector etc.), break foods (coffee, snacks)

COURSE SUPPLIES AND EQUIPMENT

Audio-Visual/Electronic Equipment

- Course Visuals (PowerPoint)
- Computer with PowerPoint software
- LCD Projector, Large Projection Screen
- Hand-held microphones (two per class) if required
- Lapel microphones for instructors (minimum of two if required)
- Laser Pointer

Classroom Materials

- Tables/Chairs (see Space Requirements)
- Easel Pads and Stands (one for instructor)

Administrative Materials

- Name tags and name tents for each student and instructor
- Class Roster
- Course Agenda
- dbS Course Evaluation Form

Student Supplies

- Pads of paper (8-1/2" x 11" size) (one per student and instructor)
- Magic Markers (several colors per table and for instructors)

- Highlighters for participants (minimum one per student)
- Acetate (non-permanent) pens (4 colors per group)
- Pencils
- Calculators (one per table)

COURSE PREPARTION MATRIX

Item	Per Participant	Per Table Group	Per Class
Reference Material			
Lost Person Behavior	1		
Urban Search (optional)	1		
Search Wheel (optional)	1		
Student Workbook (TBD)	1		
Course Material			
Maps (letter size found in Workbook)	1 or	1	
Scenario handouts (optional)	1		
Pre-Test	1		
Post-Test	1		
Certification card (optional)	1		
LPB Patch (optional)	1		
Administrative			
Agenda	1		
Class roster			1
Student Evaluation Forms	1		
Name tag or tent	1		
Audio-Visual Support			
Course DVD with PowerPoint			1
Computer with PowerPoint software			1
LCD Projector			1
Screen			1
Laser Pointer (optional)			1
Microphones with PA system (optional)			1
Easel stand/Whiteboard			1
Easel Pad			1
Markers		1	
Highlighters (3 colors)	1		
Pen/Pencil (optional)	1		
Calculator		1	
Writing paper (optional)	1		

COURSE EVALUATION

Level I: The dbS Productions Course Evaluation Form or other course evaluation form will be used to document student feedback on the overall evaluation of the quality of the content, the instruction and the facilities. The form uses a 1–5 rating system, with 5 being the highest. At the end of the course, the lead instructor will lead a feedback session so students also have the opportunity to provide verbal feedback on the course content.

Level II: A Student Evaluation will be performed to assess the students' ability to demonstrate their proficiency in applying the course and management knowledge and skills needed. The Student Evaluation will be conducted during the map problems. Instructor will review performance during the formal map exercises.

Instructor Methodology

About the Instructor's Outlines

The material, as presented in the instructional outlines and slides, is not designed to be read verbatim. While this approach will work, the well prepared instructor should be able to tailor the presentation to the unique requirements of the particular audience. In addition, each instructor should have their own unique presentation style. The slides are simply a synopsis of main points. The instructor should have sufficient knowledge to give additional insight. While this instructor's guide does supply supplemental knowledge, instructors are strongly encouraged to be thoroughly familiar with the lesson plan, student manual, suggested web sites, required textbook, and suggested reading. Space is provided for the instructor to make special notes in the lesson plan.

Departures from the teaching material

The instructor's manual was created to serve as a resource manual. All material can be supported by referenced scientific papers. However, the author acknowledges that instructors may wish to make modifications to meet the needs of their audience. The decision to drop specific slides or sections does not require any acknowledgement. For certified instructor's additional case history slides may and should be added that are specific to the audience. However, additions to course content are not allowed unless approved by dbS Productions.

For instructor's using the map problems as stand-alone instruction no approvals are required from dbS Productions since the training is not offered as an actual course.

Presentation Methods:

Several different instructional strategies may be used to present the map problems. The most appropriate method will depend upon time, experience of the participants, and the homogeneity of the students. The map problems may be presented as a class exercise, group exercise, or individual exercise. Ideally, different techniques should be used during the class.

Class Exercise

The problems may be presented as a class exercise. The instructor should inform the class they will be responsible for collecting investigative information and deploying resources. Either the PowerPoint should be shown or the initial map and assignment passed out to the class. Ideally, both should be used together. The instructor should read the initial description. The class should then be asked to either ask investigative or deployment questions. Information is

collected by asking additional questions with the answers provided by the instructor. Resources are deployed by a student stating exactly where to send the resource. The students should respond to the effect; “search the residence” the instructor would respond “nothing found.” This technique moves the class along the fastest. It also may allow dominant and or more experienced participants to provide most of the feedback. Several alternative instructional styles may also be selected.

Group Exercise

The instructor may also elect to break the class into groups. Each group should determine investigative questions it wishes to ask. After all groups are allowed the opportunity to ask questions each group should write on their group maps where they wish to deploy resources. Another method is to conduct the investigative phase as a class then the tactical aspect in groups.

Individual Exercise

Finally at least one of the reflex tasking map problems should be done individually (as they often are planned). However, the additional investigative information is best done as a class unless several assisting instructors are present. The instructor may also then pair students back into two person groups and the entire group to determine how to combine their planning. This often helps to illustrate why planning alone may have to happen, but planning together almost always enhances the overall SAR plan. Mixing different instructional techniques is typically the most effective.

Additional Comment about Map Problems: All the selected searches occurred from 1986-2009. Most of the incidents tend to be older. The passage of time was selected to insure a frank discussion is possible, since the statute of limitations has passed for any lawsuits. However, several changes in the SAR community have occurred. Development of higher standards for tracking dogs and mantrackers is a relatively new development. For this reason on many of the searches mantrackers and tracking dogs were not available at the time. Students at the completion of this course should request the deployment of these resources. However, in the interest of fairness, the students should be told “the resource is not available” versus making up bogus clues or trails.

Maps

The use of maps is integral to the instruction of either the Lost Person Behavior course or the use of the map problems as a stand alone. The most advantageous method of instruction is to use the same maps that participants actually use on actual incidents. This can range from color maps created using software and printed on a large-format plotter to paper topographic maps to black and white copies printed on letter (or A4) sized paper. Matching reality is always preferred. On a real search incident the search area is seldom limited to a letter size map. In reality two – four topographic maps may need to be pasted together. However, a letter sized map limits the search area which can assist participants new to search planning and to the initial tasks. Several different options exist in between these extremes. Color maps are always helpful to students. The instructor should always strive for color. Unfortunately, color maps are also a little bit more expensive. Instructors are responsible for obtaining their own maps needed for the class. However, several resources are offered to assist with obtaining maps. For each map problem the instructor DVD contains the following color maps:

- PDF of the relevant 7.5 minute 1:24,000 topographic map
- PDF of the map problem on letter size paper
- PDF of the map problem on tabloid size paper (only available on map problems where tabloid size is required).
- JPEG file of the map problem on letter size

The letter and tabloid sized maps are all gridded using UTM one kilometer grid lines. The grid was included to provide a sense of scale. If the UTM lines were hard printed on the USGS base topographic map, then they represent the NAD27 datum. If they were added to the map then the WGS84 datum was used. However, in the case of the map problems the map datum should be largely irrelevant since they are used only for scale. The map problems also provide the coordinates of the IPP and the find location using the decimal degree latitude and longitude format. This was format was used since it is the easiest to enter into mapping software. The decimal degree coordinates were all based upon WGS84 datum.

Many instructors' have access to large format or color printers. Printing the PDF files should be easy. If maps are laminated then they may be reused for additional classes. Another option is to purchase maps directly from dbS Productions. The least expensive option is to print black and white maps and then use color markers to highlight water features, roads, etc.

SAR Resources

In most traditional map problems in search management classes, students are asked to create a resource order and then see what types and amounts of SAR resources are actually available. This is an excellent reflection of reality. However, in the Lost Person Behavior course the emphasis is on drawing up all of the initial tasks that make sense. Therefore, participants should not be limited to only drawing up the number of tasks that reflects the available resources.

Note: It is important to note most of the techniques and instruction in this course are aimed at initial response. Therefore, the map problems that have been selected represent incidents that can be solved by correct use of initial response. This is not always the case and many incidents require more formal search theory.

Most participants naturally separate out into a preference from operations or plans. Those with a preference for operations will have a strong tendency to only right the number of task to match resources. Those with a preference for plans might take a little longer but will be more willing to keep righting tasks. If participants inquire about the number of resources or the number of tasks they need to develop the instructor should encourage them to write as many as possible. This will keep both the faster and slower participants involved. This also means the instructor should not wait until the entire class has finished before reviewing the map problem.

Alternatively, if the instructor does wish to provide resources they should tailor the list for the type and number of resources that are typically available for their own region. The second response is typically even greater. **If the instructor wishes to make resources part of the map exercise they should add a PowerPoint slide or prepare a handout that lists the resources. Another option is to list the resources on a easel pad.**

Finally below is a list of resources that might typically be available for many of the map problems for the initial response.

Local law enforcement:	1-6
Incident Commander:	1-2
Planning Section Chief/Operations Section Chief:	1-4
Logistics Section Chef:	1
Investigations:	1-3
Communications Unit Leader:	0-2
Additional Command Post Staff:	0-4
SAR Field Team Leaders:	2-8
SAR Field Team Members:	6-24
Mantrackers/Signcutters:	0-4
Air-Scent Dog teams (handler and dog):	1-4
Tracking/Trailing dog team (handler and dog):	0-2
Mounted:	0-2
ATV with SAR trained operator:	0-3
Boats with trained operator	1-2
Boats with sidescan sonar	0-1
Fire and EMS volunteers with variable field skills:	6-24
Emergent volunteers with variable field skills:	0-24
Helicopter:	0-1
Fixed wing:	0-4

Since logistical support is not part of the Lost Person Behavior class all logistical requirements asked for should be provided.

Introduction

Lost Person Behavior is a critical element of search theory. It provides information that helps the search planner, team leader, and team member's best determine where to look. If resources are not deployed to the correct location, the subject will not be found. If team leaders fail to deploy the team within the search area in an appropriate manner, the chances of making the find are reduced. Ultimately, it is the team member who must typically place their eyes on the subject, recognize the subject, and make the all important detection. Lost Person Behavior is one of the most important tools to help locate the subject.

A solid understanding of lost person behavior assists in the placement of resources into the correct location sooner. While this does not guarantee a find, it does increase the subject's odds of being located sooner. Faster finds results in fewer resources, less cost, and most importantly of all, a better chance of survival for the subject.

Field experience has shown that an in-depth understanding of lost person behavior can significantly reduce the time it takes to locate a missing subject. However, the topic is only offered in search management courses, and in a highly abbreviated format. This course provides guidance and formal training that teaches industry specialists to utilize this important tool.

This course is focused on lost person behavior primarily in a ground search and rescue environment. However, some sections do address missing aircraft and search subjects who enter the water from the ground. It does not address traditional maritime search and rescue. This course is intended to benefit new or experienced search and rescue team members, team leaders, and search planners. This course is not intended to provide in-depth instruction on search management in general.

After completing this course, participants will possess the basic knowledge necessary to apply the concepts of lost person behavior both in the field and in base work. In addition, search management personnel will have a better understanding of tools available to deploy the initial tasks.

The material in this book may also serve as standalone training or continuing education. Each of the various map problems or exercise could make the perfect practical problem for a team's regular training schedule.

Unit 1
Activity 1-1
Welcome Opening
Missing Ginseng Hunter

Objective: Demonstrate that even without any statistical profiles or subject profiles, good investigation still allows developing a good plan and tasks.

Instructor Preparation: The instructor must read and be thoroughly familiar with the activity guide and scenario. The activity involves only one PowerPoint slide which shows the map. A copy of the map and scenario is provided in the Student Workbook. Alternatively, the map may be passed out to the students.



Instructor's notes: Participants should be told that the purpose of the class is to learn about subject categories and the relevant statistics that help better define probable locations. However, statistics and profiles are simply tools. In some cases the subject may not clearly fit into an existing subject category. This map scenario illustrates a case where no subject category existed at the time for missing ginseng hunters. Therefore, to develop likely areas to look good investigation is required.

Participants should be given initial scenario information and then told if they wish additional information they need to ask. If they wish to search a certain feature, they need to specify where they want to look. The instructor should provide an appropriate response. Misleading information should not be given. The instructor may choose to conduct the map problem with the instructor leading the discussion with the map displayed as a PowerPoint slide, in groups (requires passing out maps), or with participants working individually.

The subject is a 76-year-old male. He has a known heart condition and he is on high-blood pressure and high-cholesterol medication. Otherwise he is in good physical shape. He is mentally sharp and has no cognitive problems. The morning of being last seen he complained of chest pains at church. He has hunted for ginseng his entire life. As typical for most ginseng hunters, he always goes out alone and never tells anyone where he gathers. He knows the area well and spends most of his time off-trail. Friends report he has mentioned going into the national park before. This is not uncommon for the area.

The wild ginseng root from Appalachia is highly valued in Asian market and a gatherer may receive approximately \$1000 per dry pound of the root. Therefore, it is typically only found deep in the forest. It is often over harvested and many "hunters" will trespass onto others property. It is illegal to gather ginseng from the national park (red boundary line) but legal from the Rapidan Wildlife Management Area. Ginseng is not heat-tolerant, so in southern states it is usually found only in mountainous areas. It grows in well-shaded areas (north- or east-facing slopes) of moist hardwood forests, especially where tulip poplar, maple, beech, hickory, walnut, and, sometimes, oak trees are present. It prefers moderate slopes. The more

mature the forest (with large hardwood trees and a full canopy that shades out most shrubs, briars, etc.) the better for the plant. Ginseng often grows where you also find trillium, cohos, jack-in-the-pulpit, wild yam, goldenseal, and Solomon's seal.

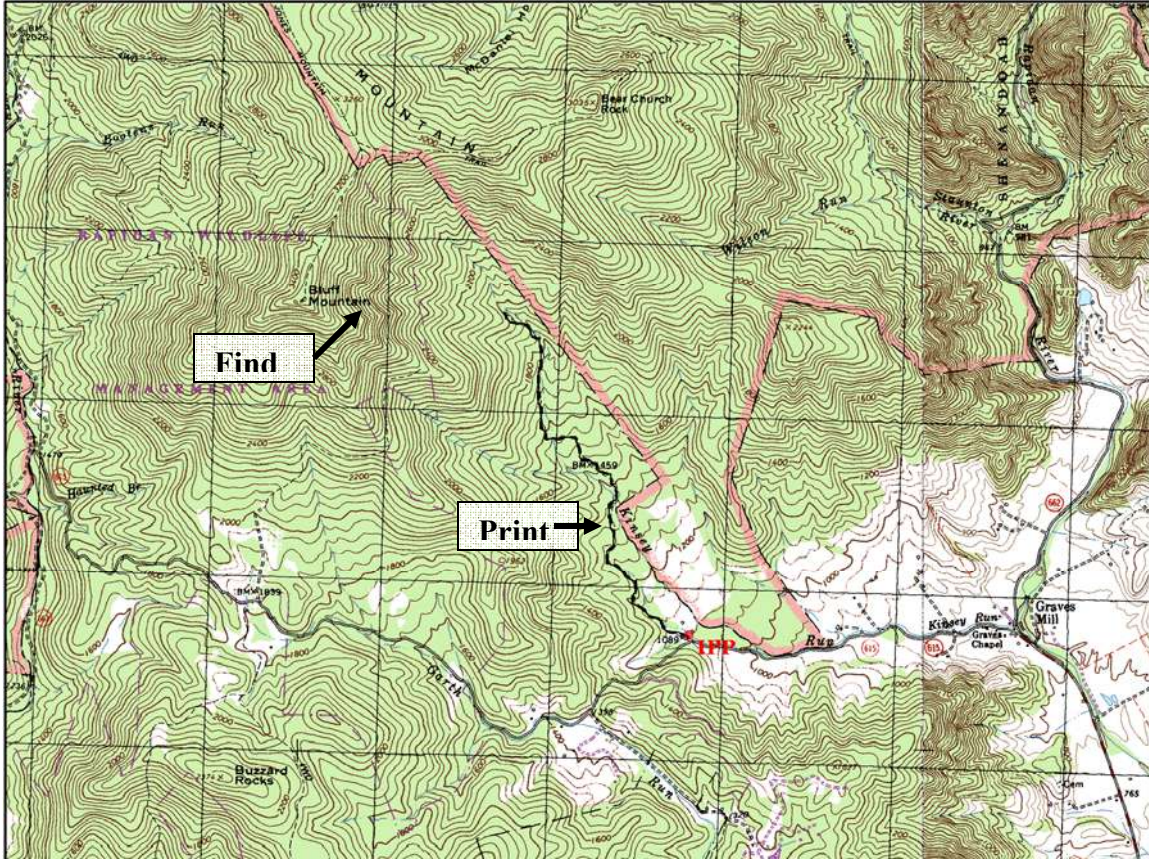
The subject is carrying a small day-pack with a cloth to wrap the roots in, a gardening trowel, a water bottle, two breakfast bars, and a 38 caliber handgun with six rounds. He is dressed appropriately for the weather with tan pants, boots, wool shirt, black hat, and green coat.

Scenario: The subject is a 76-year-old male ginseng hunter. The wild ginseng root can be sold for around \$1000USD per dry pound. He was last seen by his wife Sunday right after lunch (13:00). He told her he was going ginseng hunting and would be back by dinner time (18:00). He did not return for dinner. After two-hours she reported him missing. His vehicle was soon located at the spot marked on the map as the IPP. It was parked on the side of the road across the street from a trailhead that leads to the north. The car is in working order. It is mid September, no rain in the forecast, temperatures in the mountains get to lows of mid 40F (7C) with daytime highs of 72F.

What actually happened: The search required five days. The find location was identified as an area of high probability early in the search but search efforts were hampered by steep terrain and the thick understory of mountain laurels and rhododendrons. Eventually 200 active duty marines were brought in and over 150 SAR professionals responded on a weekend. This allowed a mixed team of park rangers, SAR professionals, and local emergent volunteers to be tasked high enough on Bluff Mountain. Local emergent volunteers were somewhat problematic since when they found ginseng they often harvested it during the search effort. Making dug up areas a less valuable clue.

Learning points: The keys to identifying the most likely search area were all based upon investigation. With a departure of 13:00 and expected return of 17:30-18:00, this only left 4.5 – 5 hours away from home. Subtract the 15 minutes of driving time one way and this leaves 4 – 4.5 hours to actually be out in the woods. Most gathers will spend at least two hours doing the activity, so that leaves 2-2.5 hours for movement to the site. This would limit the out range to about 2 miles. With the car parked at the trailhead (some discussion did occur at the time about the possibility he was trying to trick his friends about his location) it was felt he would start out by moving north up the trail. This was somewhat confirmed by the one print. Therefore, it was felt he would be located from 10 – 2 o'clock with north representing 12 o'clock. The eastern slopes did have a higher priority based upon local knowledge of ginseng habitat.

The identification of the medical scenario meant it was felt he would be found along his intended route of travel and not wandering outside the immediate area. Knowing the habitat of ginseng was also important from a planning perspective.



Topographic Map: Fletcher and Madison, Virginia USA. NAD27 UTM lines are hard printed on the USGS quadrangles.

IPP Coordinate: 38.4225032 N, 78.3903137 W (WGS84)

Clues:

Print. At a good track trap right on the trail, a boot print was found matching his size and type of boot. (38.4288823 N, 78.3954599 W)(WGS84)

Find Location: He was found at the point indicated on the map, by a sweep team sent to investigate a possible cave that was known to local residents. He was found deceased sitting against a tree. He had fired three shots from his firearm. (38.4393743 N, 78.4126873 W)(WGS84)

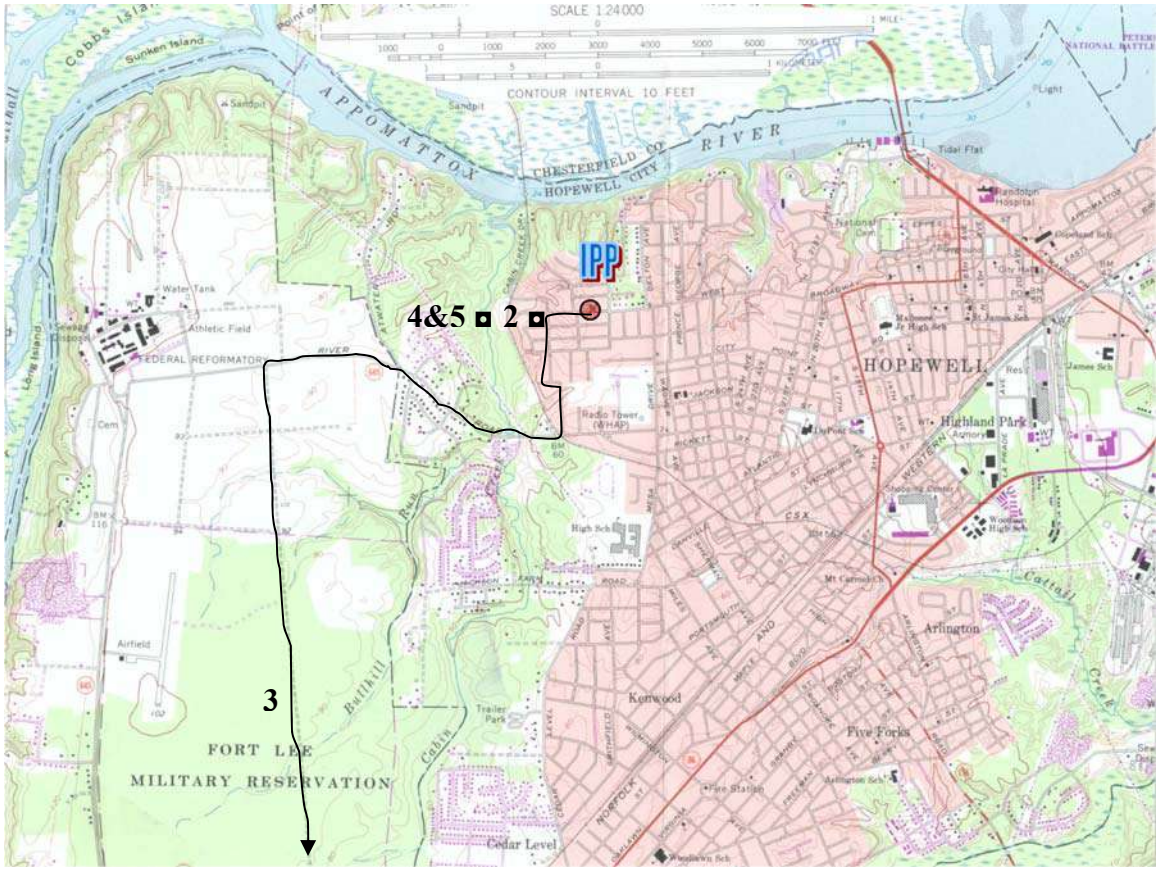


Unit 1
Activity 1-2
Welcome Opening
Hopewell Incident
Urban interface

Objective: Determine the student's/classes basic ability to take minimum information and determine an effective strategy and tactics for a typical urban ground SAR incident.

Instructor's notes: Participants should be told this incident is part of the pre-test. They will be given minimal information and expected to draw tasks on the map that represent where they would deploy field resources. In this particular case they will **NOT** be given the opportunity to ask or receive additional information. The instructor after introducing the scenario should give a specified amount of time to work on the problem and then collect the maps. Therefore, be sure to ask the participants to mark the maps with their name. The instructor will review the maps to get an overall impression of the class. The maps will not be graded. **The solution to the problem will be presented later in unit 6.**

Initial description: 68 year old male suffers from moderate Alzheimer's disease. He has been the subject of three other searches. In all three searches he departed from home and was found at the location indicated on the map. The subject was reported missing by his wife at 17:30. He has been missing for 30 minutes. He is in average physical condition for his age. It is February, highs in the 50's, lows in the upper 30's.



Topographic map: Hopewell, VA

IPP Coordinate: 37.3018339 N, 77.3174828 W

Unit Three
Activity 3-1
Lost Person Strategies
Decision Points & Terrain Analysis

Objective: Describe and identify decision points. Identify how terrain will guide a lost subject in specific directions.

Text Reference: Page 32-36 Illustration found on page 34, 35 and 36.

Instructor's notes: Decision points are one of the key concepts in understanding lost person behavior. For several subject categories decision points are the main reason the subject becomes lost. Decision points can be described as map or field based decision points. The following map problem illustrates a map decision point since all the points can be determined by looking at a map. A field based decision point is one that can only be pointed out by someone in the field. The instructor should briefly define a decision point, state their importance in some subject categories, tell the difference between field and map decision points, present the scenario, then explain why each of the four points were selected as potential decision points. Only the first four decision points along the trail are shown.

Once a highly likely decision point is identified or a clue helps refine a location, then terrain analysis helps to define the lost subject's possible routes (if they are mobile). Most subjects will tend to follow linear features. Uphill or downhill are always possibilities. Uphill is becoming more common with cell phones.

Scenario: The subject is a 17-year-old female backpacker with very mild mental retardation. She is part of a "hoods in the woods" youth program. The entire group had stopped at the IPP for lunch. After lunch the fast hikers left first with one counselor. The subject was seen heading down the trail by the counselor taking up the rear. When the tail group finally caught up with the lead group at the next stopping place, the subject was missing.

#1. At the first point the trail comes up to the saddle and then makes a sharp right turn. In the east most ridges have game trails. So it is possible a game trail could be found on the ridge. More importantly, saddles often have a game trail that would lead to the closest source of water. Since this potential trail should continue in the general direction as the trail prior to the sharp turn this has potential for an error.

#2. The trail veers off to the left, so if someone continues in the general direction of travel they could end up on the east side of the ridge.

#3. A trail intersection. From a map perspective it would be unknown as well it is marked.

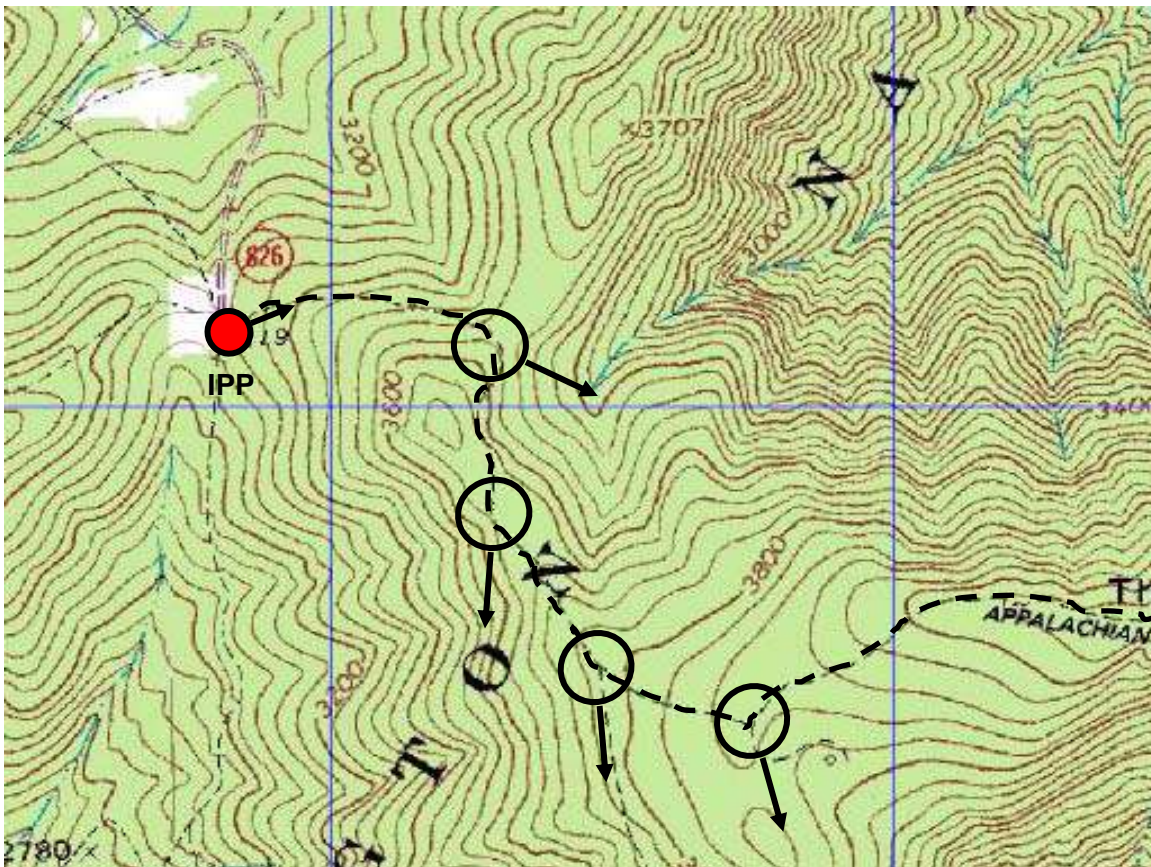
#4. Intersection with a small dirt road headed to a barn or other out building. Unknown if still exists.

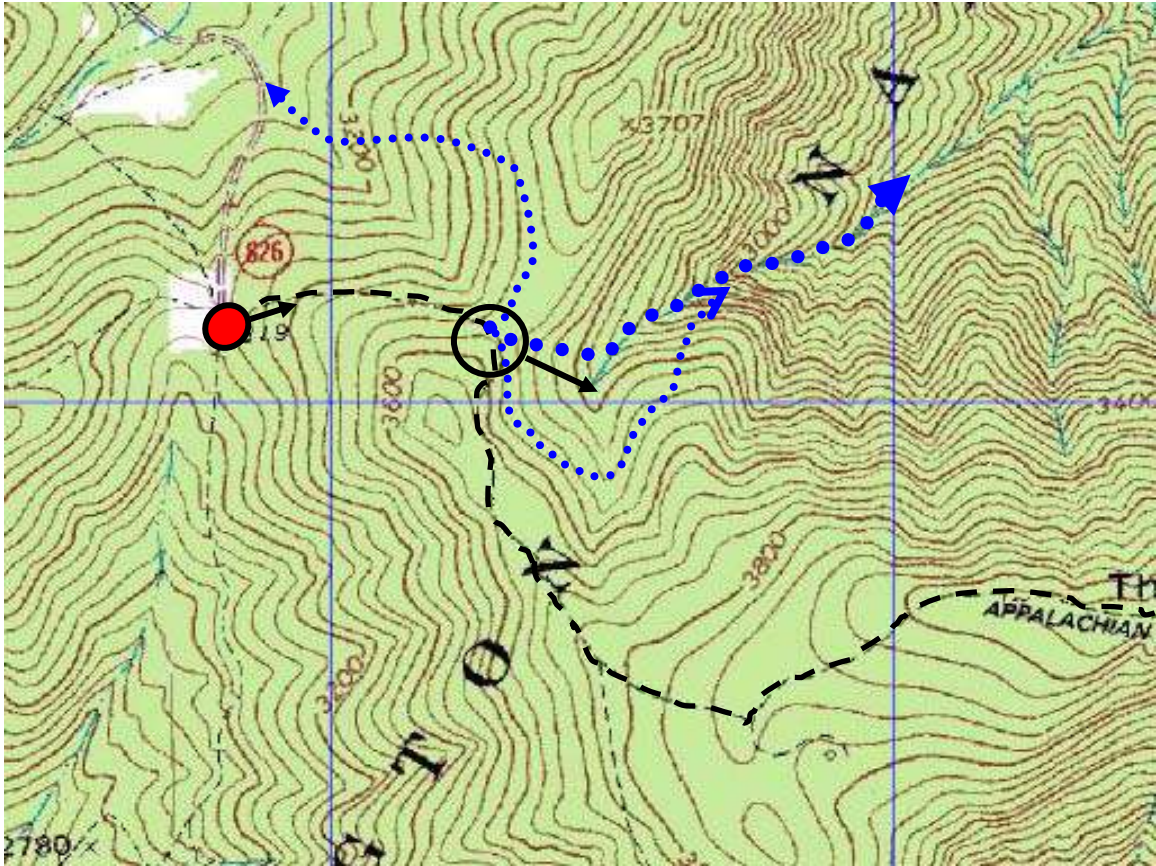
What actually happened: The subject made the error at the first decision point. Scuffed up leaves were quickly located by a team assigned to head down the drainage that started at the decision point. Next they located her backpack which she had taken off. Finally they located her alive (but starting to have minor seizures) by the stream in the major drainage. The team making the find reported “just below the A in National.” Unfortunately, a grid system was not used on that incident.

Learning Point: The key is identifying all possible decision points. Most students will not select the first decision point as a likely point to make the error. Those involved in search management should get in the habit of looking for decision points even while out on recreational hikes or walks. Good information from the field will often help. Which means team leaders should be trained in basic Lost Person Behavior.

Topographic Map: Massies Mill, Virginia USA. NAD27 UTM are hard printed on the USGS quadrangle.

IPP Coordinate: 37.8252494 N, 079.0818668 W WGS84





Once a mistake is made, most subjects will be guided by the terrain. The large blue dots indicate the path most likely to be taken. In fact, it was the path taken. If the subject had a cell phone then the summit of mountain X3707 would be an important location.

Unit 3
Activity 3-2
Lost Person Strategies
Brown Mountain Circuit Hike

Objective: Demonstrate decision points, how even experienced hikers can make a mistake, then illustrate the thought process

Instructor's notes: Participants should be told the purpose of this case study is to look at the thought process of even experienced hikers and group dynamics. The couple involved was recently married. The incident involves a highly experienced hiker and SAR professional and his wife, a fit but less experienced hiker. Some of the factors to help bring out are the impact of lack of preparation, lack of a map, tendency to not want to turn around, and group dynamics. The purpose of the exercise should be given to the participants, and then read the overall scenario. Instructor may ask the class to identify major decision points using the intended route map. The instructor should then show the decision point (missing junction of Brown Mountain Trail which was on the right of the Big Run Portal Trail) where the error was made. Then the instructor and describe the thought process and dynamics of the couple.

Scenario information: A 40-year-old highly experienced male and his fit but less experienced new 34 year-old wife decided to take a spontaneous summertime afternoon hike while driving back along Skyline Drive. They did not have a map or any supplies other than a bottle of water and some snacks found in the car. For route planning they used the map posted at the trailhead. They parked at the Brown Mountain Overlook. Intended route is to hike west, head southwest down the Rocky Mountain Run Trail, continue downstream along the Big Run Portal Trail, then return along the Brown Mountain Trail. The circuit hike totals 9.8 miles (15.9 km) with an elevation change of 2100 feet (640 meters). The trailhead map estimated 6 hours and rated the circuit as strenuous. Based upon previous experience the couple estimated it would take 4 hours. They departed at 14:00.

What actually happened: Hike started as planned from Brown Mountain Overlook, down Rocky Mountain Run Trail (blue), down Big Run Portal Trail (blue) but then they missed the turn off of the Brown Mountain Trail. The male had hiked the Big Run Portal Trail before and was actively looking for the turn off to the right. The Big Run Portal Trail makes several crosses of Big Run stream and he knew it was close. However, right when they reached the trail intersection they focused on the bridge and got distracted. The lack of a map was the single biggest causative factor. The Big Run Portal Trail continues over the bridge and comes to a gate (yellow). The male protested that crossing the bridge did not make sense and suggested turning around. However, they continued onward "just to see". So they continue on (trail marked in yellow). The couple knew they should not leave the park, the male mentioned taking a turn to the left did not make sense, the female said try it anyhow. They continued up the Rockytop trail (orange) with a queasy feeling this was not correct. At the red segments they fully acknowledged they were on the wrong trail. After some "discussion" they decided to continue onward since it was climbing and would eventually intersect with the Skyline Drive. Upon reaching the Skyline Drive (green) they would follow it in order to

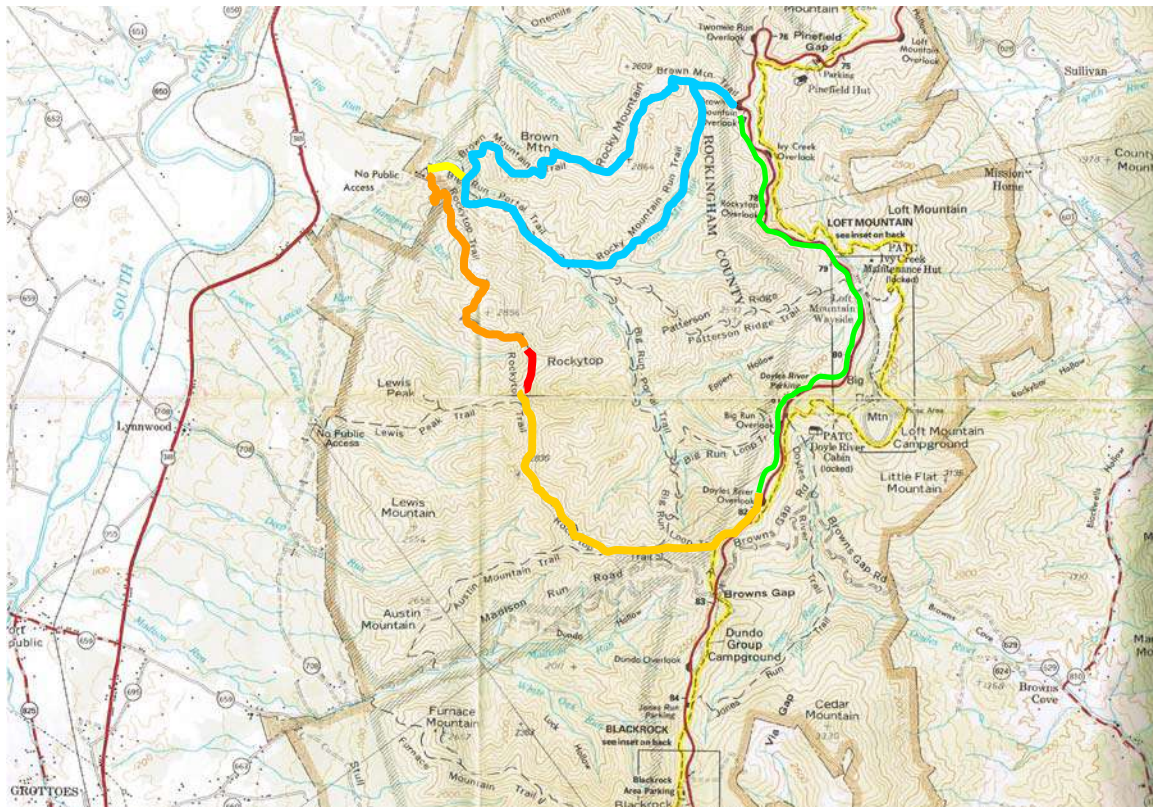
get back to the car. This they did and the 10 mile hike turned into a 20 mile hike. Since they did not tell anyone where they were headed or a time back, no search was launched. However, the incident illustrates decision points, the need to follow a trail, the strong reluctance to turn around, and the near consequences of being unprepared. Good weather, being in good condition, lots of summer light (they did not have a flashlight), and a general understanding of the layout of the park, kept them out of trouble. If any of those factors had changed, then the domino affect of mistakes could have easily led to a search. They finally reached their car at 22:00 and visited one of the park facilities to get water out of a vending machine.

Map Used: Potomac Appalachian Trail Club Map 11 “Appalachian Trail and other trails in Shenandoah National Park – South District”

Topographic Map: Mc Gaheysville, Virginia. USA

IPP Coordinate: (Brown Mountain Overlook) 38.2926580 N, 078.6582420 W

Decision Point: 38.3062761 N, 078.7035077 W (WGS84)



Unit 3
Activity 3-3
Decision Point Demonstration
Field Exercise

Unit 3
Lost Person Strategies
Cross-Country Travel – Achray

Objective: Demonstrate errors that may occur with cross-country travel.

Instructor's Notes: This incident is taken from the book *You are here: Why we can find out way to the moon, but get lost in the mall* by Colin Ellard. The full story can be found in the introduction to the book. Additional information was provided by the author in order to generate the actual maps. The book is published by DoubleDay. The incident occurred to the author on a canoe trip. It is used to illustrate how one can become lost when attempting cross-country travel and also has a decision point (two in this case). The incident takes place in Algonquin Park in Ontario, Canada. The author is a researcher who does not have much experience hiking and camping. He went on a family canoe trip with his wife and two children. On the third-day (of course it rained the entire time) they wished to find a quicker way back. Instead of a long canoe trip they decided to walk back to the cars. In order to do that it required they walk cross-country from the campsite by the lake to a trail that was 100 meters/yards to the south. Then they simply had to turn right in order to head west back to the car. The vegetation was described as thick underbrush.

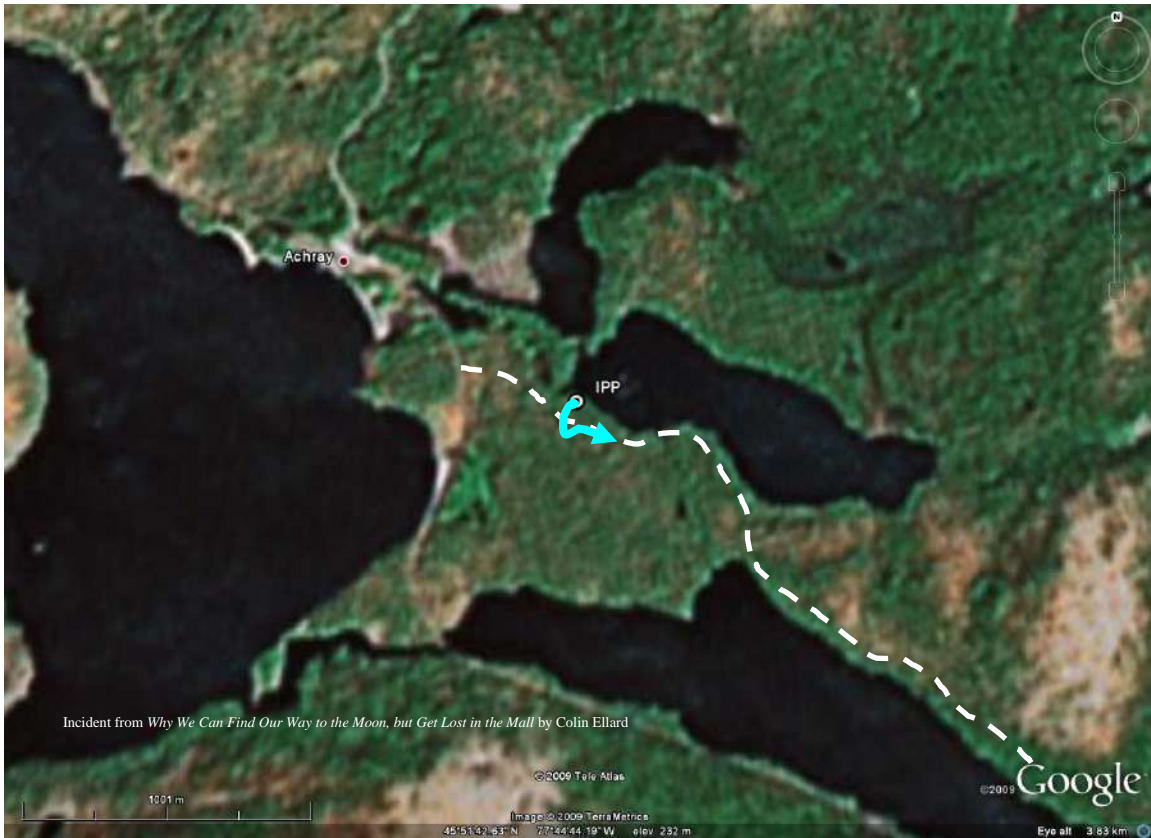
The instructor should present the objective and the basic scenario. It is most effective if the instructor ask the class what they think might have happened. Have some initial class discussion the instructor should provide the information that they missed the trail but doubled back on it. The instructor should ask what direction the group went. The group traveled east of course.

Scenario. A family of five (husband, wife and three daughters age 5-14) heads to Algonquin Park in Ontario, Canada; an area of vast wilderness roughly the size of the country of Portugal. It takes them four trips to canoe all the equipment in to their lakeside wilderness campsite. After three days of rain, it is time to return home. They decide, based upon looking at a tattered trail map, that it would be quicker to travel 100 meters/yards cross-country south of the campsite, intersect with a trail, then hike a kilometer (0.6 miles) west back to the car. A second couple would take the canoes. The second couple say the family leave into the woods. They then canoed to the parking lot. Which took 2 hours. The family had not arrived yet. The total cross-country trip should have taken 45 minutes. The vegetation was described as thick underbrush. After another hour they still had not arrived. What do you think might have happened and where would you look?

What actually happened: The family complete walked over the trail. This occurs rather frequently when looking at cross-country travel and SAR cases. Since they did not have any wilderness training or a compass, it is not all that surprising that they started to curve. They eventually curved back to the trail. Thinking they had come to the trail as intended they turn right. However, now they were traveling east instead of west as intended. Even though the trail curved back to the lakeshore and they saw a prominent landmark (small island with an

osprey nest in the sole tree) they convinced themselves that is was a quirk of fate that a similar island on a different lake was present. It was not until an hour of hiking in the wrong direction occurred, that they figured out their mistake and turned around. In reality, this incident did not result in a search, because they did eventually turn around and backtrack.

Map source: Google Map. IPP Coordinate: 45.862333 N., 077.744888 W



Unit 3
Lost Person Strategies
Devils Ditch – Lost Strategies used

Objective: Demonstrate how a lost party may decide to try to use several different lost subject strategies. A secondary goal is to identify decision points and the importance of investigation.

Instructor's notes: A father and son decide to go on a weekend Father-Son camping bonding experience. The father is a Vietnam veteran who suffers from Post Traumatic Stress Disorder (PTSD), his 10-year-old son is described as a video-playing couch potato. They have conflicts, so one of the goals of the trip was to improve their bond. They planned their trip by using the internet to identify circuit hikes located in Shenandoah National Park. They parked at Bearfence Mountain Parking Saturday morning. The intended route was to follow the Appalachian Trail to the north, then head down the well marked Conway River Road and campout along the Conway River. The next day they would continue up the Slaughter 4WD road back to the parking lot and return on Sunday. On Monday they were reported overdue. The investigators used the internet browsing history to find the website the father had used to plan the trip. They then contacted the National Park who quickly located the car at the trailhead. A backpacking permit had been completed for overnight camping along the Conway river. A hasty of the most likely intended route uncovered some overnight campers who remembered talking to the father and son. This become the revised PLS indicated by the red dot on the map. The conversation confirmed it was a valid sighting (excellent matching of clothing and identifying pictures in a photo line up). The father had stated that the hike had really worn him out that day (pretty much all downhill with a total loss in elevation of 525 meters). He asked the witness if he knew any short cuts to make the climb back up the mountain any easier? The witness replied that their was a shortcut by going up Devils Ditch (marked in blue dots) versus the intended route for the Sunday marked in yellow dots.

The instructor should present the overall scenario to the class. Depending upon time the instructor may precede straight to the actual objective of the map problem which is showing different lost person strategies or also introduce investigative elements. If introducing investigative elements then present the scenario to the point they are reported missing. The wife has no idea of the intended destination or route. They live in the city of Harrisonburg so Shenandoah National Park is to the east and George Washington National Forest is to the West. He has no hiking maps, has never planned a backpacking trip or hike before. She thinks he used the internet to plan the hike. A review of video tape at entrance station to Shenandoah National Park would show his car entering. A review of internet browsing history would show the last site visited was circuit hikes in Shenandoah National Hike. The car was quickly located at Bearfence Mountain parking. The class should tell the instructor to check out the primary intended route and that would give the clue of the sighting. The instructor should ask about possible decision points. Time may also be given to allow the participants individually or in groups to identify possible decision points. Several exist. The primary and actual decision point is the sharp bend in Devils Ditch. The instructor should

confirm the sharp bend was in fact the decision point. The class should then be asked what strategy they think the subjects used.

The map shows their travel with each color marking a different day. After making the error at the decision point in Devils Ditch indicated by the black arrow they followed the linear feature of a secondary trail up. The secondary unmarked trail ends and they continued to follow the linear feature of the drainage up. They camped Sunday night. On the following day (color dark blue) they continued up some more following the drainage but when it ended they switched strategies to one of contouring the mountain. This was partly due to being out of shape. The vegetation was thick and they made little progress. They slept Monday night near the summit of Cliff Mountain. On Tuesday, they changed strategies again and decided to head back down the mountain to try and find the fire road again. They had descended the mountain and had reached a small stream (but no road) and were contemplating going back up the mountain to try and find Skyline Drive when two search teams were having an argument nearby (over their position). The father and son shouted and the teams connected with them. They stated they were never lost!

Scenario: A father and son decide to go on an October weekend Father-Son camping bonding experience. The father is a Vietnam veteran who suffers from Post Traumatic Stress Disorder (PTSD), his 10-year-old son is described as a video-playing couch potato. They have conflicts, so one of the goals of the trip was to improve their bond. They have backpacks and the wife noticed lots of food. They were last seen by the wife Saturday morning and the wife had no idea where they might be heading. They were due to return on Sunday night. They were reported missing by the wife Monday morning.

[Ask how to proceed at this point for investigation or continue with scenario]

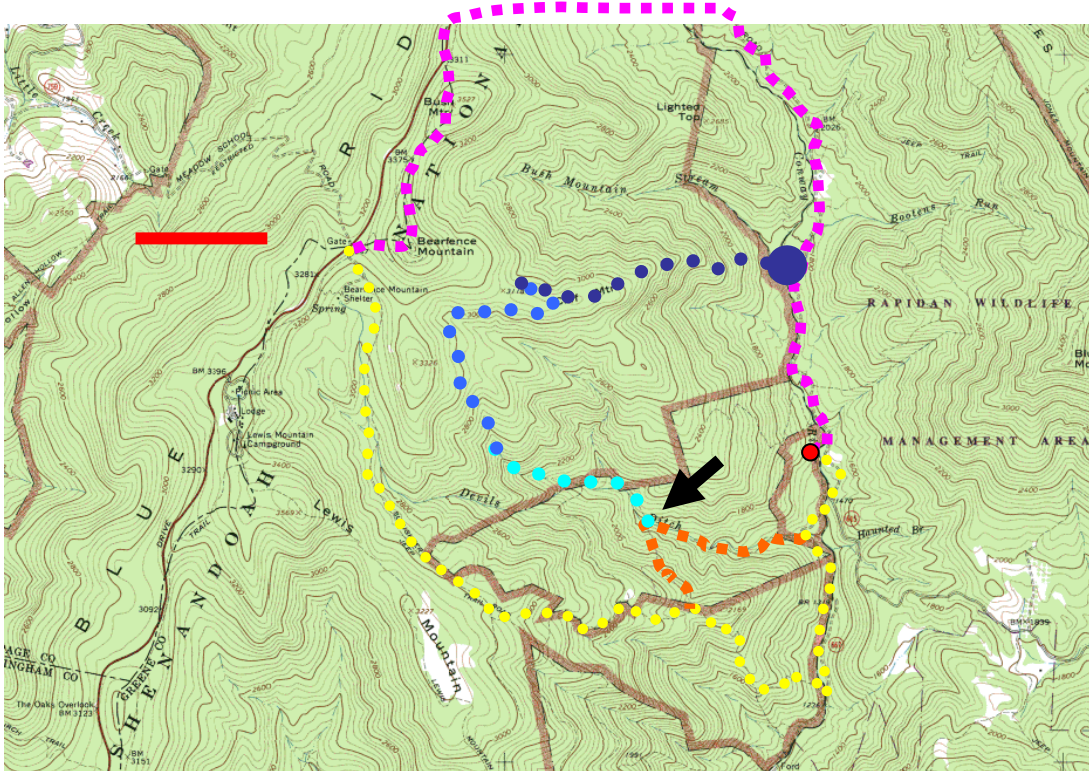
The wife knew they had planned the hike on the internet so the investigator checked the browsing history and found the last page was circuit hikes in Shenandoah National Park. A call to the park and a quick check by the rangers located their car off the Skyline Drive at the Bearfence Mtn parking lot. The circuit hike and overnight permit indicated they planned to hike north along the Appalachian Trail, east down the Conway River Road, South along the Conway River and then spend the night. The following day (Sunday) they planned to hike up (west) the Slaughter 4wd trail (indicated by yellow).

IPP: 17 07 20.8, 42 58.4 UTM

Revised PLS: 17 07 23.9, 42 57.2 UTM

Find Location: 17 07 23.7, 42 59.4 UTM WGS84

Topographic Map: Fletcher, Virginia. USA



Learning Points: Subjects made classic error at decision point. Subjects will often try multiple lost strategies. Subjects will often claim not to be lost.

Resources:

- PowerPoint slides
 - Intended route and revised PLS
 - Actual route and find location
- 3 Devils Ditch intended route
- 3 Devils Ditch actual route
- For Sale: Letter sized map intended route, color print
- For Sale: Letter sized map, intended route color print, laminated
- For Sale: Letter sized map actual route, color print

Unit 3

Lost Person Strategies

New Zealand Hunter

Objective: Demonstrate how a lost party may decide to try to use several different lost subject strategies. A secondary goal is to demonstrate why lost subjects are often unreliable witnesses in attempting to determine where they traveled.

Instructor's notes: The major goal of this case study is to once again so different behaviors. This case study also demonstrates an important caveat when interviewing subjects, they got lost – perhaps they don't really know where they went either. This case study is best presented to the class. No real need to ask for class input.



The subject is a 50-year-old male who was solo hunting deer. He and two other companions parked their car and traveled several miles (kilometers) to a bivy site marked as camp on the map. They then set out to hunt (solo) the following day.



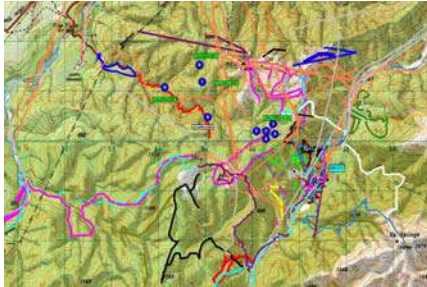
Black line on map shows the route the missing hunter thought he took. He initially went up a small drainage and did not have any success at hunting so he came back down to the main river moved a little upstream and headed back up along a ridge. He became engrossed with a stag and became lost. He had with him a GPS unit, which was new to him and he did not know how to use it. During the trip he used it a lot in the car and the battery died. He also had his rifle some shells, two muesli bars, and a small bottle of water. The first day he went over the ridge and spent some time trying to become un-lost. The second day he traveled west down into the drainage. He may have slept for the entire day since he was missing a day. The next day he continued to travel west following the drainage. He recalls coming across a traffic cone with a note for him, read the note, but continued on his path. The next day he finally came to a road and followed it to the highway.



While the GPS battery had died, by keeping the unit off and next to his body, he found he could turn it on briefly, mark a waypoint, turn it off, and move on. Once he walked out it was possible to download his waypoints. He had no knowledge of his waypoints while describing where he thought he had traveled. The following map shows the location and dates of his waypoints. Searchers then followed up on the significant departures of his actual and

expected track. They located physical clues (tracks and the muesli wrapper) to confirm the GPS waypoints were correct.

The next slide gives the ordeal from the Hunter's perspective. It should be stressed that even though he heard voices and thought he heard whistles he did not respond with shouts or firing his last remaining shot. He did not initially recount seeing the traffic cone that was left with a note, but later did mention walking past it after reading the note. Depending upon a subject for rational thought can be problematic.



The final slide shows where the search teams covered (GPS tracks). The helicopter tracks are shown in tan or silver. It can be seen one helicopter task covered the drainage he traveled. In addition one search team (red) also went down the correct drainage. These would be the voices and whistles he reported hearing.

Learning Points: Errors in overall navigation. Sun was not shining when he became lost. Developed a plan but it was a plan that changed. Subject not able to self report actual route that well. Subject ignored search team. Some conjecture among searchers he may have deliberately evaded search team. Cannot confirm.

What actually happened:

Tears as Hunter, wife reunited

Cherie Taylor: 29th November 2006: The Daily Post

Andreas Thirling will be forgiven if he sleeps through his 27th wedding anniversary today. His wife Christine is just happy to have him back.

After four days lost in rugged bush the 50-year-old Northland man walked out on to State Highway 5, about 15km south of Turangi, just before 7pm on Monday.

"It's just wonderful," a relieved Mrs Thirling said. "When the phone rang I thought they were ringing to give me an update. We are so grateful to everyone who searched for him."

Mr Thirling had been hunting in the Waipakihi Valley with two friends but failed to return from a solo hunt on Thursday.

Latching on to a stag, Mr Thirling said he became lost and the batteries on his GPS (global positioning system) died.

He walked through thick bush for four days, cutting his hands, arms and legs on bush lawyer weeds, falling and breaking his watch and losing his compass in the process.



Fear was the last thing on his mind.

"I kept thinking about my wife. I knew people would be looking for me," he said.

His only food was a single muesli bar which he cut into thumbnail-sized pieces. He collected stream water in a 500ml bottle and ate fern leaves.

"I did think about eating bugs at one stage.

One fern was like pepper on my throat," he said.

"I only slept about four hours in five days. It was freezing cold."

Volunteers from all over the Central North Island joined the search, using helicopters, dogs and kayaks; numbers swelled on Sunday to more than 40.

Mr Thirling's signals went unnoticed: he let off a few gunshots on Friday morning, but that was before he had been reported missing. Torrential rain fell that day and a helicopter flying overhead raised his hopes.

"I thought they could see me, but they couldn't.

"So I lit a fire and burnt my toothbrush. Plastic burns good," he said.

On Monday morning he found a cone and note searchers had left on a track.

Making his way through Tree Trunk Gorge Rd Mr Thirling heard traffic from the Desert Rd and knew help was within reach. The first vehicle he saw, a truck, drove straight past him.

"I realised I had a gun in my hand so put it on my shoulder. I must have looked a sight."

He waved the next car down and the driver, a man named Josh, gave him a banana and drove him to the Turangi police station.

The hunter attributes his survival to a black plastic bag, a knife and the muesli bar.

The good-news phone call that Mr Thirling had walked out of the bush came at around 7pm on Monday night, and Mrs Thirling arrived in Taupo early yesterday to reunion hugs and wet cheeks.

"The tears came automatically - he looked so scratched," she said.

"When you go through the bush for days you don't look very nice, and he was dehydrated. But otherwise he's in good spirits. He just needs a good rest," she said.

Hunting companion Wayne Smith said he was impressed with the search efforts and remained confident his mate would make it.

"I'm just surprised he didn't eat worms. He ate a possum once. If it's edible he'll eat it."

While his mate carried a GPS, people shouldn't rely on electronic devices unless it was a personal locator beacon, Mr Smith said.

"Anything can go wrong, but with a beacon you will be found within two to four hours."

Search and Rescue police Senior Constable Barry Shepherd said he was surprised the hunter had survived.

"You are always optimistic in the back of your mind but we had no clues in four days. We thought we were searching for a body or someone who was seriously injured or unresponsive," he said.

Unit 3
Lost Person Strategies
Punchbowl Hiker

Objective: Give participants the opportunity to demonstrate ability to recognize decision points and rank them in order to make tactical recommendations.

Instructor's Notes: The intent of this case study is for the student to identify and rank various decision points. The case also makes an excellent study for a missing hiker with the slight twist that he is legally blind, an experienced hiker, used to solo hiking, and an ultra-light hiker. Even with all of those factors his behavior matches the profile for missing hikers.

This case is also unique in that it would be an excellent case to really illustrate the importance of investigation. The investigation had a key impact on the search effort. It is also a good case for demonstrating several different possible scenarios. For an advanced class it could be used to conduct a formal scenario analysis to determine the POA. This case also poses a huge challenge of where to deploy resources.

For the purposes of decision point analysis the scenario presented to the students picks up after the second sighting is known. This gives the initial IPP, a revised PLS, and a direction of travel. Participants should use a tabloid or full size topographic map. The assignment is to determine and label potential decision points along the AT. Then to rank your decision points to determine the top three. An additional optional assignment may be given to task a given number of resources given to the students.

Since extensive investigative background is available about the subject this may be handled in several ways. One method would all the class or groups to ask investigative questions and then supply the information. Another method would be to provide initial basic information ask the participants to complete the assignment, and then either ask for additional investigative information or simply pass out the detailed information (student handout). Then the participants should be given the opportunity to revise and update their plans.

Student Handout

Investigation Summary – Knight

Background on Knight

After conducting multiple interviews with friends, family and accompanying hikers, the following information may describe Knight and his personality.

- Knight is described as very independent and may get annoyed or agitated if someone attempts to help him without his request. This trait may be a put-off for people who do not know him. His friends understand his personality and try to help Knight without being obvious about it.
- Knight is described as being stubborn.
- Knight has hiked multiple sections of the Appalachian Trail as well as trails in Scotland. He enjoys the outdoors and outdoor activities.
- Knight is technically inclined and has "Twitter", "Facebook", and "12 Second" accounts and he is constantly updating these sites via his I-phone. He is also a freelance writer for "Backpacking Light".
- Knight is legally blind. He has one glass eye and his other eye has limited vision. He has no depth perception and when reading something he will place the object directly in front of his good eye. He hikes by feeling the terrain with his feet.
- Knight constantly goes off-trail as he has a hard time seeing the trail. He especially has a hard time at switchbacks, trail junctions and stream crossings.
- Knight falls and stumbles a lot and consequently has a high tolerance for pain.
- Knight once was lost in Maine. He lost the Appalachian Trail and ended up hiking on a logging road. He apparently hiked back and forth looking for the AT for 2-3 days until he was picked up by a logger.
- Knight is well read on the area that he is hiking but has a hard time judging distances.
- Knight is described as being disorganized and forgetful. He is known to leave critical items behind while hiking.
- Knight is known to get disorientated while leaving the trail to go to the bathroom.
- Knight hikes at a 1-2 mph pace. A good days hike is approx. 10 miles but has been known to do more He currently weighs a little more than usual and may be out of shape by his standards.
- Knight wouldn't hesitate to hitch a ride to get into town. He can be very friendly.
- Knight has been known to make up the excuse that he is sick in order to slow his group down.

Factors to consider

- Knight wanted to stop on the way down to the Blue Ridge Parkway to pick up some more food for his trip. According to Shields, he said that he was low on food even for an ultra light backpacker.
- Knight takes Dilantin. He probably didn't pack any more pills than he needed.
- Knight treats his water. If he is lost, he may not be able to identify a nearby water source.
- Knight's cell phone was low on batteries and the cell reception is poor in some places.
- Even according to Knight, he was out of shape. The trip fatigued him and may have pushed him harder than he expected.
- Knight said he was sick and that he had the "runs".

The G's continued on toward Bluff Mountain and stopped to rest south of the mountain just below the switchbacks. They stated that at this time, they met an individual hiking southbound that matched the description of Ken Knight. They stated that a hiker was moving slowly down the trail and stopped at their location. They described him as a white male with a pot belly and a beard. They said he looked sick and further described him as flushed and sweaty. They said he was wearing a hunter green dress type shirt with one button missing. He had hiking poles, white pants, and brown trail running shoes. They also said he carried an orange pack and when he checked his watch that he brought it up close to his eye in order to read the time. After seeing a picture of Knight they positively identified him as the hiker they contacted. The G's stated that they spoke with Knight for approximately 20-25 minutes. They said that Knight stated the following:

- That he was going to the next shelter and planned on staying at John's Hollow Shelter.
- That he didn't anticipate it being that hot that day and that he was "pushing his water supply".
- In a conversation about mountain lions, Knight stated that he doesn't like cats and he is allergic to them.
- He spoke about a website and that he was hiking with a group he met online.
- That he got sidetracked at Pedlar's Dam.
- Stated that he was sick and getting over a cold.

Background on Knight

After conducting multiple interviews with friends, family and accompanying hikers, the following information may describe Knight and his personality.

- Knight is described as very independent and may get annoyed or agitated if someone attempts to help him without his request. This trait may be a put-off for people who do not know him. His friends understand his personality and try to help Knight without being obvious about it.
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- Knight has hiked multiple sections of the Appalachian Trail as well as trails in Scotland. He enjoys the outdoors and outdoor activities.
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- Knight falls and stumbles a lot and consequently has a high tolerance for pain.
- Knight once was lost in Maine. He lost the Appalachian Trail and ended up hiking on a logging road. He apparently hiked back and forth looking for the AT for 2-3 days until he was picked up by a logger.
- Knight is well read on the area that he is hiking but has a hard time judging distances.
- Knight is described as being disorganized and forgetful. He is known to leave critical items behind while hiking.
- Knight is known to get disorientated while leaving the trail to go to the bathroom.
- Knight hikes at a 1-2 mph pace. A good days hike is approx. 10 miles but has been known to do more. He currently weighs a little more than usual and may be out of shape by his standards.
- Knight wouldn't hesitate to hitch a ride to get into town. He can be very friendly.
- Knight has been known to make up the excuse that he is sick in order to slow his group down.

Factors to consider

- Knight wanted to stop on the way down to the Blue Ridge Parkway to pick up some more food for his trip. According to Shields, he said that he was low on food even for an ultra light backpacker.
- Knight takes Dilantin. He probably didn't pack any more pills than he needed.
- Knight treats his water. If he is lost, he may not be able to identify a nearby water source.
- Knight's cell phone was low on batteries and the cell reception is poor in some places.
- Even according to Knight, he was out of shape. The trip fatigued him and may have pushed him harder than he expected.
- Knight said he was sick and that he had the "runs".

Garrett's contact with Knight

The Garrett's state that on April 26, at approximately 0745hrs they started hiking with their dog on the Saddle Gap Trail. From the Saddle Gap Trail they took the Appalachian Trail northbound to Bluff Mountain. They state that as they turned onto the Appalachian Trail, they saw two hikers heading southbound shortly after. They described these hikers as two older white men, one wearing light colored clothes and one wearing dark. They then stated that approximately 25 minutes later, they passed another hiker heading southbound that was wearing a knee brace. The Garrett's continued on toward Bluff Mountain and stopped to rest south of the mountain just below the switchbacks. They stated that at this time, they met an individual hiking southbound that matched the description of Ken Knight. They stated that a hiker was moving slowly down the trail and stopped at their location. They described him as a white male with a pot belly and a beard. They said he looked sick and further described him as flushed and sweaty. They said he was wearing a hunter green dress type shirt with one button missing. He had hiking poles, white pants, and brown trail running shoes. They also said he carried an orange pack and when he checked his watch that he brought it up close to his eye in order to read the time. After seeing a picture of Knight they positively identified him as the hiker they contacted. The Garrett's stated that they spoke with Knight for approximately 20-25 minutes. They said that Knight stated the following:

- That he was going to the next shelter and planned on staying at John's Hollow Shelter.
- That he didn't anticipate it being that hot that day.
- That he was "pushing his water supply".
- In a conversation about mountain lions, Knight stated that he doesn't like cats and he is allergic to them.
- He spoke about a website and that he was hiking with a group he met online.
- That he got sidetracked at Pedlar's Dam.
- Spoke about a nice creek near Lynchburg Dam.
- Stated that he was sick and getting over a cold.

After their contact with Knight, the Garrett's continued toward Bluff Mountain and approximately 20 minutes later than ran into a black male hiking southbound. The individual spoke briefly with the Garrett's about dogs and continued southbound. The Garrett's then reached Bluff Mountain at approximately 1100hrs and stayed for approximately 1 hour. At about 1200hrs, the Garrett's returned back down the trail towards the Saddle Gap Trail and found no further sign of Knight.

Change in Point Last Seen

Based on the accounts provided by Chris and Kassie Garrett, search teams were sent to the area south of Bluff Mountain. I continued to follow any new leads and updated search information was processed by the command staff.

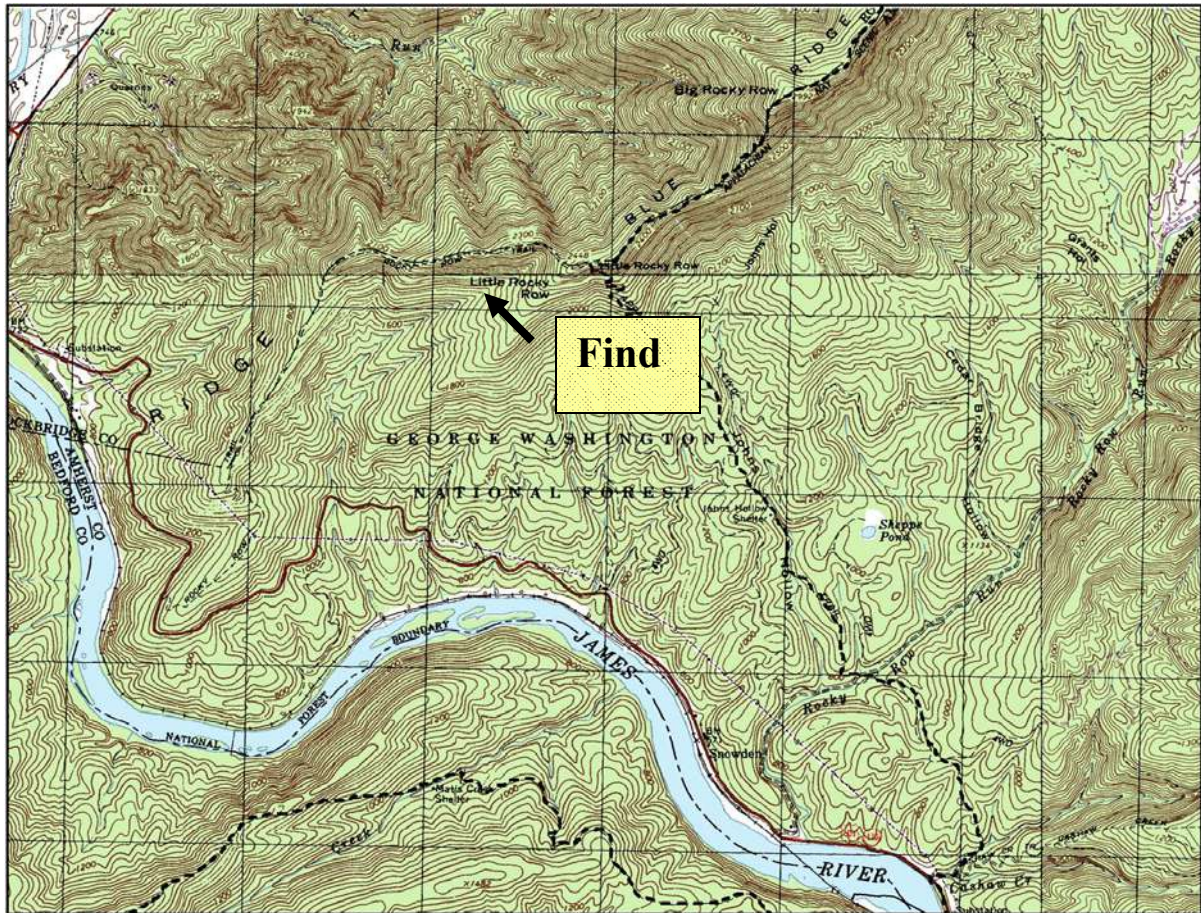
Knight Interview

On May 2, 2009 at approximately 2115hrs, Park Ranger Zeph Cunningham and I met Ken, Judith and Jonathan Knight at the Best Western in Lexington, VA. We dropped off a bag that belonged to Ken that was left with the rental car that took Knight to the Blue Ridge Parkway. We then spoke to Ken Knight about his disappearance from the trail and learned the following:

On Sunday, April 26, while at Punchbowl Shelter, he met with Kent Zotter, John Farrell, Ryland Herring, and Hezekiah Goodson. All 4 hikers were en route to Johns Hollow Shelter and stopped at Punchbowl to meet with Knight. Knight stated that he told Zotter that he would meet him at Johns Hollow Shelter and was surprised that Zotter said that he did not confirm his plans with him. Knight called this a miscommunication or a misunderstanding. Knight then said that Zotter, Farrell and Herring headed south toward Johns Hollow Shelter and he and Goodson remained at the shelter. Knight then said that he left the shelter shortly after and that Goodson, who may have been getting water at the time, left sometime after him. Knight proceeded southbound on the Appalachian Trail and reached Bluff Mountain sometime around 0930 – 1000hrs. At Bluff Mountain he posted his 12 second video and then continued southbound on the trail. Knight recounts meeting the Garretts as well as a few other hikers along the way. Knight, on a few occasions, asked the hikers heading northbound if they had seen his hiking party ahead of him. Most hikers did confirm that they saw 2-3 hikers. Knight states that he did not see Goodson pass him on the trail and believed that he was still behind him. According to Knight, he lost the trail approximately 1.5 miles from the Johns Hollow Shelter. He attempted to find the Appalachian Trail but said that he had just ran out of water and decided to head down the mountain to find some water and some nearby roads. Knight admitted that he should have "stayed put" near the trail. After a while he was able to locate a stream and resupplied his water. He then followed the stream and described that he traversed down multiple small waterfalls. Then, at approximately 1800hrs, he found a spot to camp and set up his tent.

For the next few days, Knight stayed where he was because he thought that Zotter would have called for help. During this time he made several small signal fires, blew his whistle, and would try to flash shiny objects to signal for help. He stated that during the day he would explore around his camp but would always leave a note behind stating who he was and that he would be back. Knight said that he found a large waterfall and a ridge nearby but was concerned that he may slip or fall and would not be able to return to his camp. Knight said that he rationed his food and would eat 1 meal per day. He said that he was a little sick at the Punchbowl Shelter but that his sickness passed soon after. On May 2, Knight said that he hiked upstream and returned to a big waterfall that he had found. He tried to flash shiny objects again but that did not work. He then thought that he might light a bigger

fire. He said that he had plenty of tinder and that if it “burned the forest down, oh well”. He decided that the fire would be far enough away from his campsite as to not burn it up so he lit the fire. By the time it took him to return to his campsite, approximately 2 hours later, he was met by Big Island Firefighters who were responding to the fire. They identified Knight and called into the command post to notify the searchers that he had been found.



Knights SAR Narrative

4-28-09

Blue Ridge Parkway dispatch was contacted by the Peaks of Otter Lodge reference a missing hiker report. Ranger Zeph Cunningham responded and interviewed a group of hikers led by Kent Zotter. They reported that a group of people with the common interest of hiking the Appalachian Trail meet on the internet. They agreed to meet and hike a large section of the Appalachian Trail in VA. One female hiker driving down from Philadelphia, PA stopped at Baltimore airport and picked up Ken Knight. On Tuesday April 21 the group met at the Peaks of Otter Lodge and ate together. The group divided into two groups and one group drove North on the Blue Ridge Parkway to MP 13.1 and started hiking south on the trail. On Sunday April 26 the south bound group was last together at Punch Bowl Shelter at MP 51.6 on the Blue Ridge Parkway at approximately 9A -10A. At the shelter they met with Ken Knight a member of their hiking group that had spent the night at Punch Bowl Shelter. The rest of the group had spent the prior night at Pedlar Dam. When they stopped and spoke with Knight at Punchbowl Shelter he was thought to be sick and was undecided if he was going to continue on the hike south. The group left before a final decision was made and they told Knight to meet them at the end location on Tuesday April 28 at MP 76.1. When the group arrived at the ending location Knight did not show up and had not been heard from.

Ranger Cunningham took down basic information about the subject, Kenneth Knight. Knight was legally blind, age 41, 5'4", 180 – 200 lbs, with a pot belly. Knight could see out of one eye, could read something about 2 inches in front of his face, and had no depth perception. The group had a picture taken on the trip showing Knight in the clothes he was wearing. This was e-mailed to Cunningham by Lori Shields a member of the group that had picked up Knight at Baltimore airport and drove him down for the hike. Cunningham asked the group about the urgency of the report. At the time the group did not consider this an emergency and it was determined that Knight was late arriving; this according to the reporting party was not unusual as Knight hiked at a slower pace with his vision impairment. Ranger Cunningham told the group he would e-mail out the description and information on Knight to units and cooperators that worked within the hike area. At this time a bolo was issued if anyone sees Knight to check his welfare and assist him if needed. Knight had a scheduled flight home on Wednesday 4-29-08 with Southwest Airlines to Detroit, MI on Flt 132 at 4:45 PM. There was no next of kin or family information available from the group.

After making the report to Cunningham the hiking group went their separate ways.

4-29-09

Ranger Cunningham remained in contact with Zotter by phone and Shields by email throughout the day. Zotter had contacted the airline and inquired about any communication with Knight. They would not pass this information on to him; he contacted Cunningham with the specific information. Zotter had also checked with Amtrak Police to see if Knight had gotten a ride to Lynchburg, VA for a train to Baltimore. Zotter also provided some partial

credit card information. Knight had left his travel bag in Shield's car; this was turned over Zotter on 4-28 at the Peaks Lodge.

Cunningham contacted SW Airlines Customer Service who would not provide any information on Knight. Cunningham was provided a law enforcement contact with the airline. A message was left with the airline law enforcement office but no contact was made on 4-29-09.

Cunningham had Zotter begin to contact the next of kin and family in Michigan to confirm he did not make it home or contact them.

Cunningham contacted Amtrak Police with no information available, Zotter contacted Lynchburg Police Department and asked them to go by the train station and check to see if Knight was there or had been there.

Shields e-mailed a picture of Knight on this trip out to Cunningham; Cunningham then sent it out far and wide to all NPS units, cooperators, and local agencies. No one reported back seeing Knight, a few reports came in but once shown the picture of Knight they determined it was not him.

4-30-09

Cunningham was contacted by SW Airlines about 8AM and advised that Knight did not show up for his flight nor did he call to cancel or change his flight. Cunningham contacted Zotter and advised him of this information who had contact information for Knight's parents. Cunningham contacted Jonathon and Judith Knight who advised this was unusual and they wanted to report Ken as missing. Ken was entered into NCIC as a missing person. Knight's parents were from Rhode Island.

Cunningham contacted Mark Eggeman with the VA Department of Emergency Management and gave them a heads up of the developing search. Contact was made with Supervisory Park Ranger Jonathon Holter who initiated hasty search operations in the Punchbowl Shelter and James River area. Rangers Holter, Cyr, Clark, Mammel, Cook, and Brett conducted these operations. In the mean time Cunningham coordinating efforts from the Peaks Ranger Office.

Cunningham contacted Amherst County Sheriff Office and advised them of the situation. Sgt. Carter with Amherst County Sheriff Office called back and advised she was contacting her command. Gary Roakes, Director of Emergency Management Amherst County called back and Cunningham explained the situation. Amherst County contacted VA Department of Emergency Management and requested assistance. A planning meeting was set for 7PM at Amherst County Administration Meeting.

At approx 8PM VDEM, Amherst CO Sheriff Office, Amherst County Emergency Management, and the National Park Service meet and developed a search plan for 5-1-09. It was decided to have the command post at Buena Vista Overlook at MP 45 on the Blue Ridge

Parkway. Briefing was set at 7AM with task assignments to be prepared that night, this way searchers could be sent into the field immediately.

An Investigations group was formed and VDEM took the lead that evening gathering information. Throughout the day Cunningham had NPS Criminal Investigators working on tracking the cell phone and credit card activity.

The group also made the decision to start operations at 7AM the next day and continue operations 24 hours a day as long as resources were available. Due to the timing a high number of resources were available for weekend operations 24 hours a day. Cunningham ordered Plans and Operations Section Chiefs from Shenandoah National Park. All available NPS Blue Ridge Parkway resources were notified to be at the Command Post at 7AM. This included the Blue Ridge Parkway tracking team.

Contact was made with Knight's parents approximately every 2-4 hours throughout the day. The Knight's made the decision to fly down. They arranged a flight to Richmond, VA and a motel in Lexington, VA.

Contact was also made with Rockbridge County Emergency Management, their coordinator, Robert Foresman, would be at the command post the next day. He would advise Rockbridge County Sheriff Office of the situation. Contact was also made with the USFS and they referred all Search and Rescue to the local Sheriff's Office.

VDEM ran the Pod's and to reach the 95% the search area was 11.6 mile radius, 480 square miles and included five counties. These included Amherst (point last seen just in Amherst), Rockbridge, Nelson, Augusta, and Bedford. Punch Bowl Shelter sits right on the Amherst County – Rockbridge County Line, a recent suicide at the same location as Knight's point last seen was determined to be in Amherst County. Cunningham used this information to make determination to call Amherst County Sheriff first.

No new information or clues to Knights location were received by end of shift on 4-30.

5-1-09

All resources meet at Buena Vista Overlook at 7AM. This was determined to be base for the day. Communications was established via VA EMS frequency patched through Amherst County and relayed by Civil Air Patrol air assets circling the operations area above. Task assignments were made; these included approximately 30 assignments for dog teams, sign cutters, man tracking teams, horse mounted, and ground searchers. Total incident personnel for the shift were 110. Food and Logistics was provided by NPS. Amherst County provided a mobile command post, VDEM provided tents for shelter. Operations and Plans Sections were set up in the overlook, Command staff and investigations worked out of the mobile command post vehicle.

Throughout the day the investigations group continued their work, this group included NPS Criminal Investigators, Amherst County Investigator, and VDEM Investigator. The

investigations group interviewed the other hikers with Knight on the trip and friends of Knight that normally hiked with him. They continued to follow up on the cell phone and credit card usage.

Media interest in the search began to develop midday with all local media outlets showing up at the command post. The media was briefed and interviews were provided by key officials. The media was allowed to film at the command post. Arrangements were coordinated to take the media into the field to film search operations.

Knight's parents arrived that afternoon and were provided a briefing. They spent time with the Plans and Operation Section. Both sections explained the process and orientated them to the search area by map. Randy Sutton was appointed Family Liaison with Cunningham maintained close contact and providing direct updates.

Contact was made with the USFS and request made to use their work center for base operations, this request was made based on forecasted thunderstorms for the next shift. The USFS agreed and arranged to have the facility ready for use by 1700 hrs.

We moved the Base or Incident Command Post to the USFS Work Center at 1900 hours. All night resources were dispatched to the new base location. Plans and Operations were set up immediately, a radio operator was set up and night operations began immediately.

The night of 5-1 14 task assignments were completed. VDEM provided the overhead to support the night operations and the CAP continued to provide the air resources to provide communications.

No definite clues had been found to date. Some reporting sightings of Knight were reported in the US Route 60 area, plans were made to focus some search operations in that area the next day shift. All the reports after investigated proved to be false.

5-2-09

All day shift and newly arriving resources met at Base at 7AM for briefing. A briefing occurred with a quick synopsis of events leading up to the search, a summary of completed operations, an overview of the planned operations, and more information from the investigation group. Some of Knight's close hiking friends from Michigan had arrived and provided some personal insight to the group. This information was helpful to the searchers trying to locate Knight.

Amherst County provided the food, a cater was set up at the Command Post. Rockbridge County provided water and breakfast. NPS continued to provide Ice, Gatorade and Health foods for the resources working around the clock. Logistics was run by Danny Myrtle with the Blue Ridge Parkway, he ordered BLRI maintenance personnel to assist in the Logistics Section.

The Operations Section starting sending out 28 task assignments right after briefing ended. The search area was extended to the North based on some possible sightings in that direction.

The parents came to the command post and received an updated briefing and then went to visit Punch Bowl Shelter. They were lead there by a search team going out on task. After spending some time at Punch Bowl they returned to the command post for another update. I briefed them on the 911 information we had received the night before and explained our plans were going to focus on that information once confirmed. After this update the parents went out for a while to take a break.

Information came in through 911 the night before from a local couple, the Garrett's, who reported to have seen and talked to Knight after he left Punchbowl Shelter. They left contact information. Investigations started trying to contact them first thing. No luck was had in contacted them until around noon. Holter was able to make phone contact and confirmed that they had seen Knight and he was southbound on the AT after leaving Punchbowl Shelter. The Garrett's agreed to come and go with out teams and show them exactly on the ground where the point last seen was. In the meantime Cunningham and Eggeman (VDEM IC) immediately began to refocus all tasks and resources in this direction. Dog teams and sign cutters were deployed first followed by ground searchers. Task assignments to support this new focus were immediately written and readied for resources as they came available. A resource order was placed for more new and fresh searchers and dog teams.

Around 3PM the USFS contacted Cunningham and advised that they had smoke reports in the Bluff Mountain area. They had resources responding to the scene.

After the smoke report a radio transmission was heard over the incident radio system that "we have him". It was unknown at the time where the transmission came from. Further investigation revealed that Bedford County had patched their Fire Dispatch Channel into the incident system so Big Island Fire Department could talk to Search Command. Big Island Volunteer Fire Department had responded to the smoke report and found a 2-3 acre wildfire. Upon arrival at the fire they found Knight camped below the fire along the creek. Knight immediately started packing up and told the fireman he was lost and had been camped since Sunday waiting for searchers to come find him. Eggeman left the command post immediately after the radio transmission came in and headed to the fire. He arrived and confirmed 100% that Knight was alive and in good condition.

Sutton and Cunningham notified the parents to return to the Command Post, when they arrived we told them the good news. At this point it was unknown where Knight would be taken. The parents remained at the command post until the decision was made to take Knight to Lynchburg General Hospital to be check out. Cunningham and Sutton coordinated with the parents and arranged for Sutton to take a local resource familiar with getting to Lynchburg General with him and the parents would follow in their rental car.

Big Island Rescue Squad transported Knight to Lynchburg General where he was checked out and found to be in good health with no injuries. He was reunited with his parents and friends. Once Knight was released from the hospital his parents wanted to return to the

command post and thank everyone. Cunningham advised them that most resources had left the command post and that a small group of NPS resources were just about finishing cleaning up the Command Post. It was agreed that Cunningham and Barron would meet them at their motel in Lexington and conduct a follow up interview with Knight.

Cunningham notified Blue Ridge Parkway Chief Ranger, SE Region Emergency Service Coordinator, SHEN Dispatch, and numerous friends and SAR organizations that were involved in the search.

At approximately 9PM Cunningham and Barron meet Knight and his parents at the Best Western, Lexington VA. Barron conducted an interview with Knight while Cunningham spoke with his parents.

Sutton continued to contact and update the media.

Unit 6
Reflex Tasking
Matthews Arm Case

Objective: Demonstrate the concept and process of reflex tasking using a case scenario.

Text Reference: Chapter 9. Determining Probability of Area – Reflex Tasking page 295 – 301.

Instructor notes. This scenario also exists has a html web problem found at <http://www.dbs-sar.com/SARsim/index.htm> Some of the information is slightly different than that presented on the website. The information presented in this course should be used.

Participants are presented with basic information on a PowerPoint slide. Next they are presented with the dilemma of a search area representing the globe even after the IPP as been identified. The traditional management process of defining the theoretical zone is presented next. However, this is not useful since it still covers 1,256 square miles (3,252 square kilometers). The 95% statistical zone provides a much more meaningful limit on the size of the search area. This is what this course advocates for the limit on the search area unless a search is started quickly and the theoretical is actually smaller. The statistical 95% zone is a circle so in the deductive step it is converted to meaningful boundaries that searches in the field may find. Several slides explain the bike model for determining reflex tasking. The tables for reflex tasking in the text book should also be pointed out. The slide that shows the map again allows the instructor to click to demonstrate axel, hub, containment, and hub tasks. The instructor should attempt to force the students through the thought process of the bike model.

Scenario: Here you will be responsible for searching for a missing mild dementia subject out hiking. You have been called to Matthews Arm Campground for a fit missing 82 year old male last seen today at 1000. He normally walks 3 miles (5 km) everyday in Sweden. He is visiting Shenandoah National Park along with his family. He was also missing for a few hours yesterday but wandered back into the camp. The point last seen is indicated on the map below. He was reported missing by family members at 1930 when the dog he went out to walk returned to the campground. The current time is 20:00 It is a warm August day in the park. Highs in the 80's and nighttime lows in the 50's. It is currently clear and warm.

What actually happened:

Investigators determined the following:

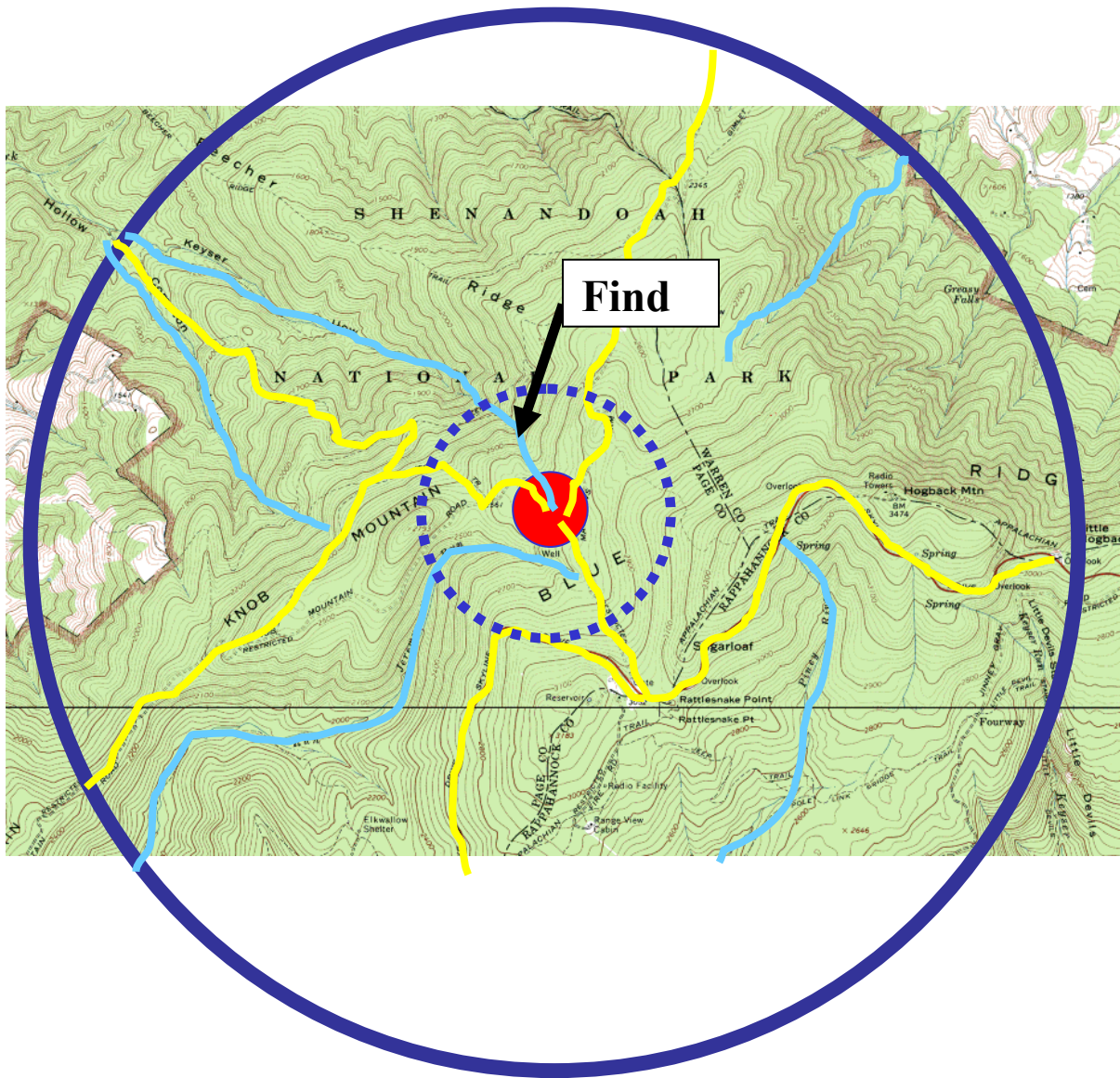
- Two National Park Service Investigators arrive and determine the following:
- The subject's name is Oluf, a resident of Sweden. He has been in the United States for a month, as part of a two month visit with his family. He goes by the name of Oluf and speaks only limited English. A physical description is taken. He wears glasses and other than his passport wallet, he has no other equipment with him. He

does not smoke. He has no physical disabilities or medical problems. He is not taking any medications.

- The family reports he has not been diagnosed with Alzheimer's disease. He has not been taken to a doctor for a diagnosis. However, the family reports during the past 6 months they have noticed an increase in confusion and forgetfulness. It also appears his short term memory is worse. He is able to dress and wash himself. He is able to cook, but on occasion will put ice-cream in the refrigerator, or the ice cube tray in the toaster oven. He is able to take his daily 2-4 mile walk back in Sweden without getting lost. He has managed to incorrectly balance his checking account the past three months. Lately he seems a little bit more agitated. These are all classic signs and symptoms of dementia if not Alzheimer's disease.
- Subject retired 15 years ago as a watch repairer.
- Subject has walked and hiked his entire life.
- Subject has been at the campground for three days. Three days ago when first arriving, he said he was going for a short 30 minute walk but did not return for an hour and a half. When the family asked what took so long, he replied he got side tracked and lost track of time.
- Subject has never wandered away in Sweden
- Safe Return program has been contacted. Subject was not in database. However, information will be forwarded to all local jurisdictions.
- Subject information flyer prepared and sent to all local media outlets.
- Radio report sent to surrounding jurisdictions.
- Subject entered into NCIC and VCIN.
- Contacted all local hospitals (emergency room and psychiatric ward).
- Contacted all local rescue squads and fire departments.
- Contacted local shelters.
- Contacted Virginia State Police.
- Contacted local morgues and medical examiner's office.
- Ran check on subject's credit cards -- no activity listed.
- Ran criminal background checks on subject and family- no criminal background.
- Ran criminal background checks on all cars parked at campground- nothing significant.
- Canvass campground - nothing significant - the guy likes to walk.
- Investigator's working hypothesis- he is lost out in the woods.

What really happened: The search occurred in the early 80's before Alzheimer's or dementia had become a common buzz word. The subject typically walked 3-4 miles (5-7 km) in his native land of Sweden. His family reported they noticed he seemed much more confused during the last 8 months. The family was visiting the United States and as part of the visit went camping at Shenandoah National Park in Virginia (please note: it is not recommended to take Alzheimer's disease patients camping in the wilderness!). Initial hasty tasks focused on searching the camp ground and running trails. An air-scent dog had a weak alert during an initial night task at the intersection of the jeep trail and Keyser Hollow run drainage. A follow up hasty task down the drainage then made the find first thing the

following morning. The subject was in good condition. He stated he simply had gotten confused. He was able to walk out of the woods unassisted. It is not clear how he had gotten to his location.



Topographic map: Bentonville, Virginia, USA

Find Location: 38.7654692 N., 078.3016080 W.

Resources:

- PowerPoint Slides
- Matthews Arm LTR. PDF map
- For Sale: 6. Matthews Arm – Dementia Letter size, color, laminated or unlaminated.

Unit 6
Reflex Tasking
Hopewell Incident
Urban interface

Objective: Demonstrate to students how reflex tasking and the bike model also work for urban searches.

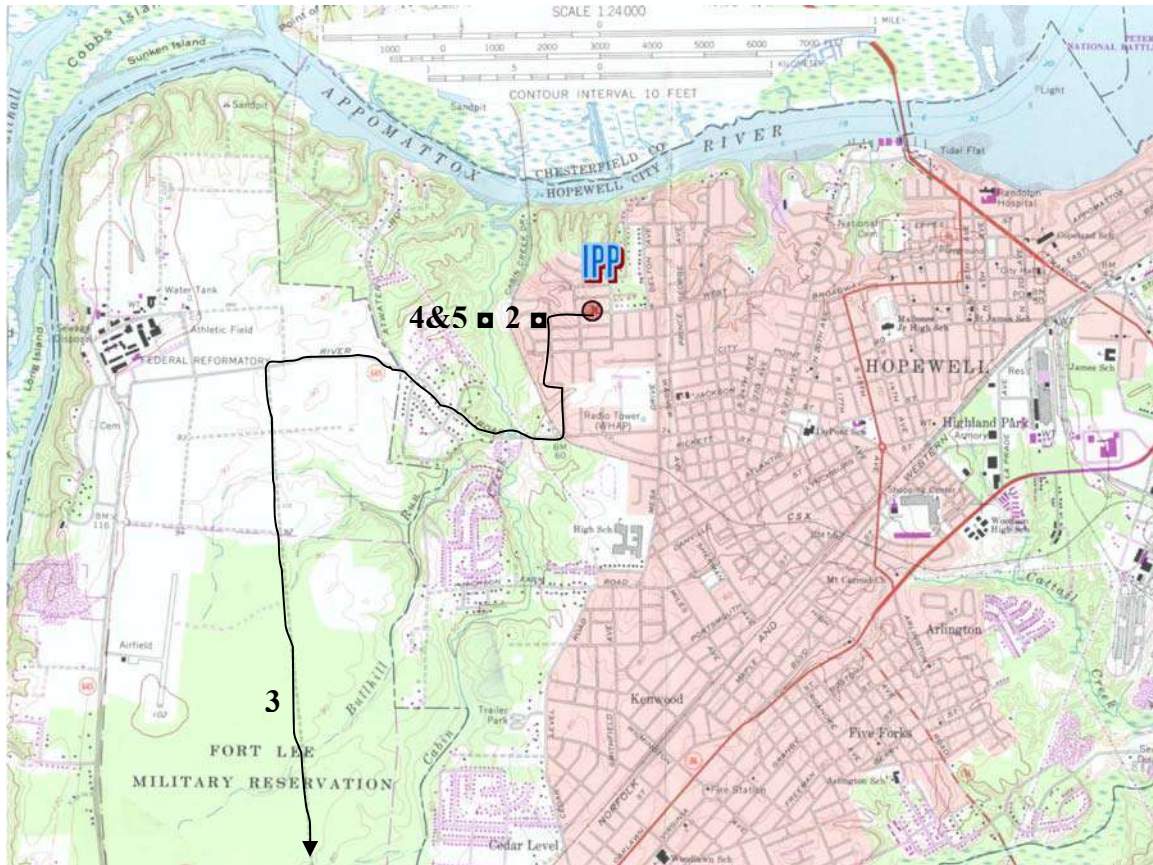
Instructor's notes: The instructor should state the objective of this scenario is to once again demonstrate the use of the bike wheel model and reflex tasking, this time in an urban environment. The instructor for this problem will attempt to get feedback from the class in applying the steps. The instructor may elect to provide all of the key relevant investigation information or have the participants ask for it.

Initial description: 68 year old male suffers from moderate Alzheimer's disease. He has been the subject of three other searches. In all three searches he departed from home and was found at the location indicated on the map. The subject was reported missing by his wife at 17:30. He has been missing for 30 minutes. He is in average physical condition for his age. It is February, highs in the 50's, lows in the upper 30's.

Clues:

1. Locations where he was previously located.
2. Sighting: A neighbor sighted him walking west along the road he lives on. High reliability of sighting based upon clothing and time. Information requires neighborhood canvas or media release. (37.3017993 N, 77.3213917 W)
3. Trailing dog: A scent-discriminating German Sheppard follows the track indicated on the map. The team has a reputation for both outrageous claims and finding subjects in previous searches.
4. Air-scent dog alert: Air-scent dog team alerts. Wind is non-directional and seems to be following local micro conditions. (37.3017303 N, 77.3241838 W)
5. **Find location** (37.3017647 N, 77.3241409 W)

Map:



What actually happened?

Search resources were contacted at night. The trailing dog did report the track presented in the map problem. However, this search occurred before the existing training standards were developed. An air-scent dog team did have the dog alert in cabin creek. Since the alert occurred at night it was followed up with a second dog task the following morning. It is a good practice to repeat all reflex tasks that occur at night again in the light. The subject was found alive by this team early in the morning. The subject was buried in mud up to his chest. He had a core temperature of 85° and was airlifted to the hospital. He recovered, as neurology intact as when he first became missing.

Learning Points: Need to canvass neighborhood in urban searches. Value of reflex tasking. Follow up on night time tasks. Careful evaluation of all tracking clues.

Topographic map: Hopewell, VA

IPP Coordinate: 37.3018339 N, 77.3174828 W

Resources:

- 1HopewellLTR.pdf PDF of letter size map
- PowerPoint in Unit one contains presentation map.
- For Sale: Letter sized map, color print
- For Sale: Letter sized map, laminated

Unit 6
Reflex Tasking
Biscuit Run - Hikers
Rural

Objective: Students demonstrate use of reflex tasking to determine tasks.

Instructor's Notes: Students are given limited information on purpose. Part of the purpose of this exercise is determining how to dispatch resources with limited information. The second purpose of this exercise is to rapidly determine tasks. Students should only be given 10-15 minutes to complete the exercise. The instructor may choose not to give the students the available resource list. Instead the students are instructed to generate as many tasks as possible within the specified time period.

Situation: It is 00:05 a warm summer night in June. Two 19 year old females were last seen at 17:30 leaving a friends residence (IPP). The two should have returned home (indicated by red circle) at 18:30 to go out to dinner with other friends. They are both students at Brigham Young University and are described as extremely responsible and reliable. The students are roommates at the university. One student has lived at the home location for 8 years. The second roommate is from out of state.

Assignment: Draw up tasks using the following resources:

- 2 air-scent dogs
- 2 Field Team Signcutters
- 1 Field Team Leader
- 2 Field Team Members
- 2 Law enforcement officers
- 2 IC-II

Required Materials:

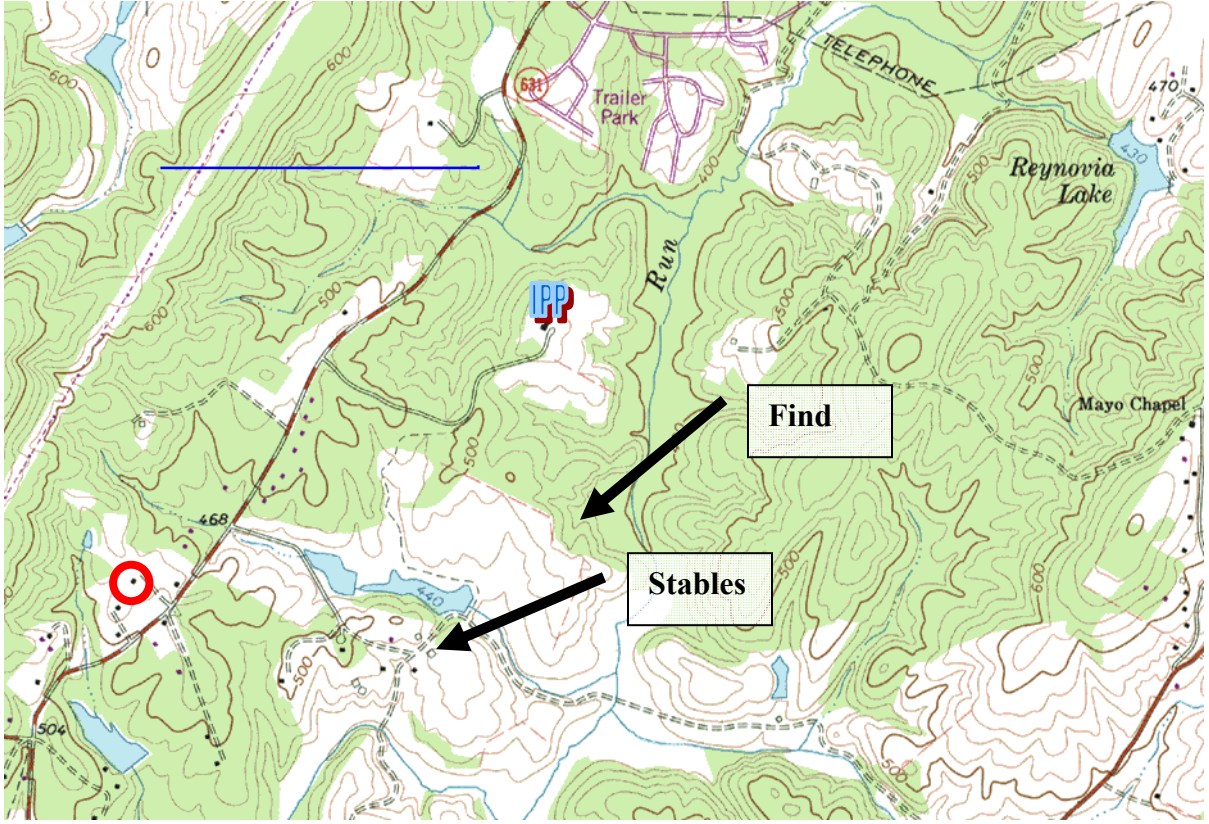
Student handout
Highlighters or markers
Mission Map

Topographic Map: Alberene, VA

IPP Location:

Find Location: 37.9861759 N., 078.5261560 W

What really happened: The two friends decided to take a short cut in order to visit the horse stables at location A. They quickly became stuck in the thickets. Once night fell, they decided to stay put until morning. They were located by the first task dispatched using reflex tasking principles.



Unit 6
Reflex Tasking
Quinque - Dementia
Rural

Objective: Students demonstrate use of reflex tasking to determine tasks.

Instructor's Notes: Students are given limited information on purpose. Part of the purpose of this exercise is determining how to dispatch resources with limited information. The second purpose of this exercise is to rapidly determine tasks. Students should only be given 10-15 minutes to complete the exercise. The instructor may choose not to give the students the available resource list. Instead the students are instructed to generate as many tasks as possible within the specified time period.

N.B. This map problem has changed a little bit from the presentation given during the classes in 2009. A site visit and confirmation using Google Map showed the IPP was in the wrong location. So the IPP and the find location have changed a tiny amount. The basic map problem remains the same. At the time of the search Route 33 was not a divided highway as shown by the Google Map image. The topographic map is a good reflection of the search at the time it occurred.

Initial description: 85 year old male with moderate dementia was last seen at his residence at 15:00. The former farmer has lived in this house for the past 40 years. He is taken care of by his son and daughter-in-law. He has been lost on three previous occasions. This time the son checked the gates that lead to the locations where he was previously found. He reports the gates were all closed and that he checked the dirt in front of each gate for footprints. He reports he did not see any footprints. It is June with a temperature of 75, no chance of precipitation, and night time lows of 65.

Clues:

1. Locations where previously located
2. No tracking dogs or trackers available
3. Subject located

What actually happened: Fifty resources from the local rescue squad, fire department, and sheriff's department were quickly mobilized. Most of the resources were sent to locations where the man was previously found, essentially ignoring the information provided by the son. However, some resources were sent across route 33 in order to check the drainage. At the time, as indicated on the map, route 33 was a two lane highway. It currently is a four-lane divided

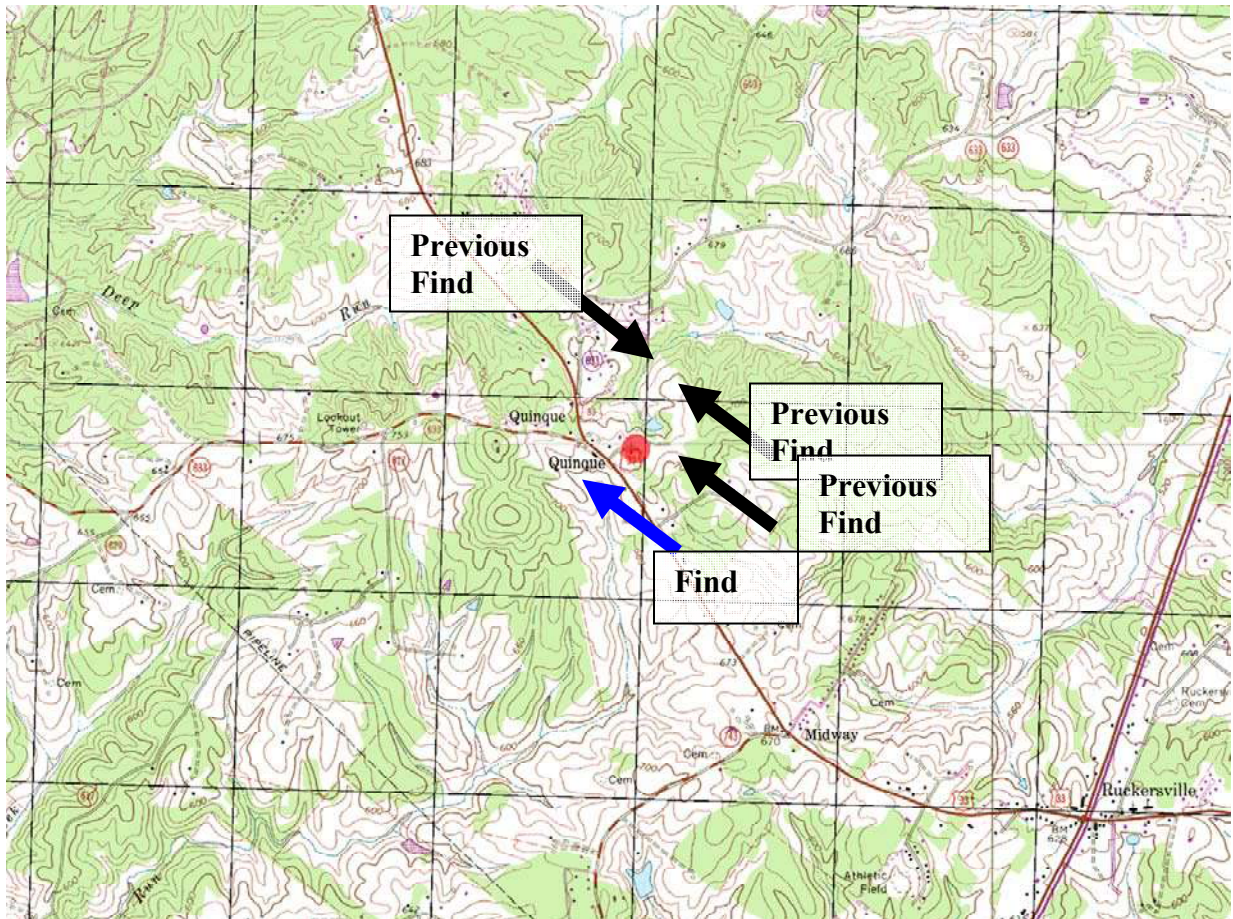
highway. Nonetheless, always look on the opposite side of roads. Alzheimer's disease subjects have managed to walk across interstates. The subject was in fact located directly down his driveway across the road. He was found in good shape, but trapped in briars. The team was only 5 minutes into its tasks when it made the find. From the arrival of search management the search only lasted 23 minutes.

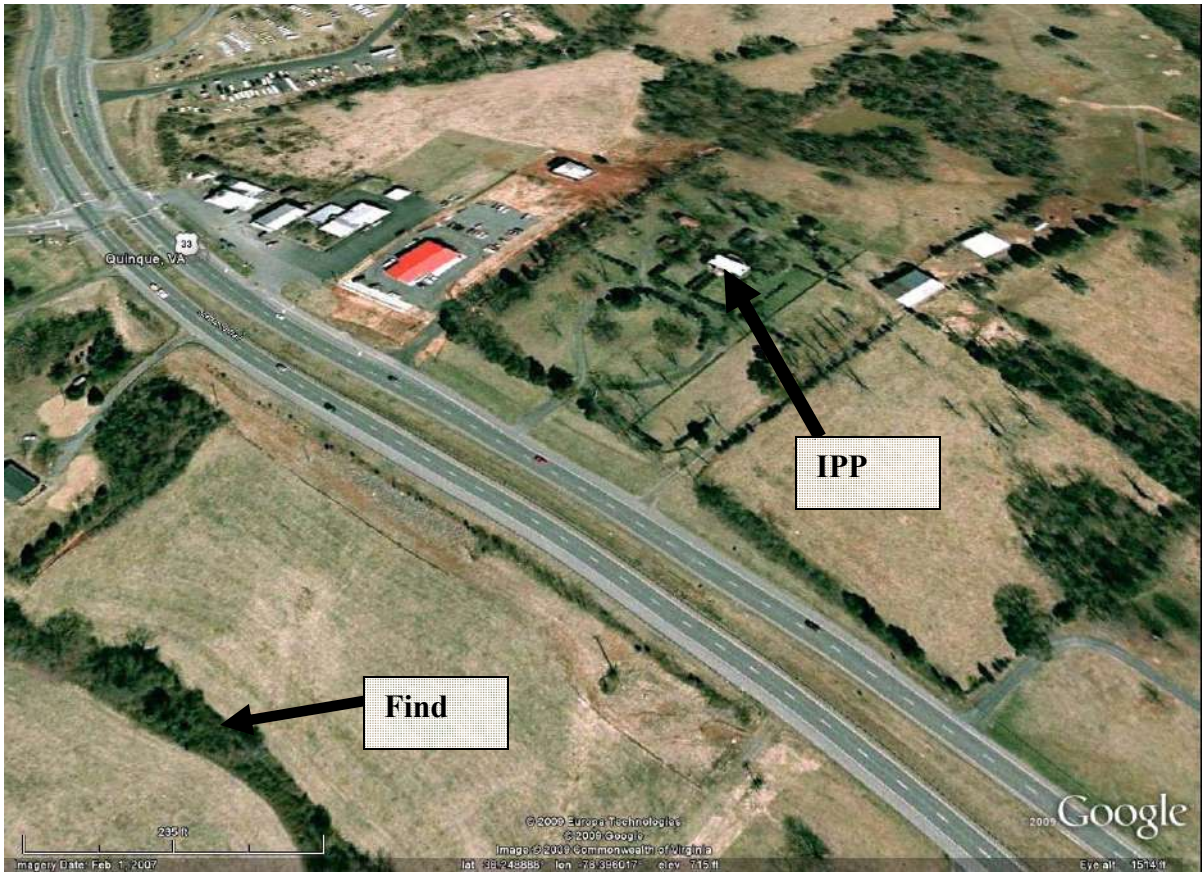
Learning points: Reflex tasking, subjects will cross roads, listen carefully to information provided by the family but areas still need to be verified. The search is also interesting that it occurred at the junction of four maps. An experienced search manager will quickly tape the four maps together. Inexperienced managers have been known to use the edge of the map as a search boundary. Lost subjects tend not to use map boundaries as travel aids!

Topographic map: Earlysville, VA

IPP Location: 38.2498274 N., 078.3952693 W

Find Location: 38.2496545 N., 078.3975770 W WGS84





Note: At the time of the search US 33 was a two-lane road instead of the four-lane divided highway seen in the photograph.

Unit 7
Subject Categories
Aircraft
White, Pass WA

Objective: Demonstrate determining Probability of Area and the use of the aeronautical statistical models using an actual incident.

Text Reference: Page 99-105

Additional Reference: *Data Collection and Analysis for NASA World Wind Search and Rescue Visualization Program* by Robert J. Koester in Instructor Resource DVD

Instructor's Notes: Mission 07I-5850 (AFRCC) which involved a Cessna 208B carrying 10 people from Snake River, ID to Seattle, WA is used to illustrate the statistical models used in aeronautical incidents. The first three PowerPoint slides are screenshots of Google Earth annotated by the AFRCC and supplied to searchers as part of the package provided by the AFRCC to search management. The next two slides illustrate the final moments of the flight. Note the loss of altitude at a rate of 6800 FPM (feet per minute) for the last radar hit. Also the note of staying at 13000 for three hits is mostly likely explain has flying flat just prior to a stall. Mount Rainer is the mountain seen in the background. The next slide shows the same radar hits but looking straight down. The white arrow was added to illustrate the direction of travel determined by the second and last radar hit. The final four slides use the statistical model generated by a Bayesian model for the specifics of this incident. First, the ring model is applies, then the plot offset, next the dispersion angle. Finally, the crash site location is found.

Scenario. The pilot flying a Cessna 208B was returning a group of skydivers from Snake River, ID to their home base after a weekend of skydiving. He flew several jump flights, and then stopped early in the afternoon to prepare the airplane for the flight home to Seattle, WA. The flight was planned into an area of clouds, turbulence, and icing, which the pilot had researched. He delayed the departure until he decided that he could complete the planned flight under visual flight rules (VFR). The accident occurred at night with little illumination of the moon, and the airplane was in an area of layered clouds.

A hunter was at a campground a few hundred yards east of the accident site. He estimated that about 1950 he heard a loud noise that he thought sounded like a dragster or engine winding out. A few minutes later, he was outside his trailer, and heard an airplane engine and observed airplane lights west of his position. He saw a bright white light as well as red and green navigation lights. The lights appeared to be moving horizontally, and then moved vertically toward the ground. He heard what he thought was a thud, and reported this to local officials.

NTSB Factual Report

HISTORY OF FLIGHT

On October 7, 2007, about 1959 Pacific daylight time, a Cessna 208B, N430A, collided with terrain near Naches, Washington. Kapowsin Air Sports Ltd was operating the airplane under the provisions of 14 Code of Federal Regulations (CFR) Part 91. The commercial pilot and nine passengers were killed; the airplane was destroyed. The flight departed Star (ID92), Idaho, about 1750 PDT, en route to Shelton (SHN), Washington. A ground observer reported low clouds, rain, and fog at the accident site. Stampede Pass (KSMP), Washington, immediately north of the accident site, reported low instrument flight rule (LIFR) conditions. Night time conditions prevailed, and no flight plan had been filed.

The pilot flew a group of skydivers from Shelton to Star on October 5th for a weekend of jumping. The owner of the Skydive Center at Star indicated that several jump flights were accomplished on the day of the accident. A witness stated that the pilot checked the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) web site several times during the day. He also noted that the pilot spoke to someone. After the last check, the pilot indicated that he would be able to make the trip under VFR conditions.

The pilot quit flying early in the afternoon to prepare the airplane for the flight back to Shelton. The flight departed about 1750, and the pilot circled the airport once before departing the area.

A hunter was at a campground a few hundred yards east of the accident site. He estimated that about 1950 he heard a loud noise that he thought sounded like a dragster or engine winding out. A few minutes later, he was outside his trailer, and heard an airplane engine and observed airplane lights west of his position. He saw a bright white light as well as red and green navigation lights. The lights appeared to be moving horizontally, and then moved vertically toward the ground. He heard what he thought was a thud, and reported this to local officials. He noted that the cloud bases were below the mountain tops with misty rain conditions and low visibility. Examination of a topographical map indicated that the peak immediately west of the accident site was about 6,350 feet. The accident site elevation was 4,300 feet.

Yakima officials began to mobilize search teams, and notified the Federal Aviation Administration (FAA). The FAA reported at the time that they had no reports of a missing airplane. Yakima Search and Rescue was about to terminate the mobilization, when the operator notified the FAA of an overdue airplane. The Prescott Automated Flight Service Station (AFSS) issued an alert notice (ALNOT) at 0108. Yakima Search and Rescue began searching the following morning, and found the wreckage about 2000 that evening.

RADAR DATA

A review of recorded radar data identified a target in the vicinity of Star about 1751, at a mode C reported altitude of 2,400 feet mean sea level (msl). The target circled around Star one time, and then transited across Oregon on a northwesterly course. (All target times have been converted to PDT, and the target points occur about every 12 seconds). About 1807, the target attained a mode C altitude of 12,400 feet, and maintained that altitude until 1828:30. The target then began a climb, and reached a mode C altitude of 14,400 feet at 1832:17. At 1839:02, the target began a descent, reached its lowest point of 13,700 feet, and then climbed to and leveled off at 14,200 at 1841:01. The target maintained a northwesterly course and mode C altitudes of 14,200 and 14,300 feet. The target then turned to the north toward Yakima as it approached the Washington border. At 1924:53, the target began a descent and reached a low point of 9,300 feet at 1931:15, and then immediately began a climb. At 1944:10, the target reached a mode C altitude of 14,400 feet, and maintained this altitude until 1955:41. Near Yakima, the target began maneuvering. The target turned west, then southwest, west, then northwest, west, southwest, and then west again. As the target neared the accident site area, it descended to 13,700 feet at 1956:17. As the target started a gradual right turn to the north, it began a climb to 14,300 feet. The target then descended to 13,600 feet, and then the right turn tightened as it climbed to the east, reaching a peak altitude of 15,000 feet at 1958:40. There were three targets at 15,000 feet, as the right turn continued. The next three targets were the last three targets from this radar site that had altitudes associated with them. They were at 14,900 feet as the target was going west; 14,800 feet as the target was going north, and 14,400 feet

as the target was going east. The next two targets continued the right turn, but did not have altitude data. Data from a different radar site recorded targets at 13,000 and 8,900 feet. A Safety Board specialist examined the radar data during this time frame to examine the performance of the airplane, and his findings are discussed later in this report.

PERSONNEL INFORMATION

A review of FAA airman records revealed that the 46-year-old pilot held a commercial pilot certificate with ratings for airplane single-engine land, multiengine land, and instrument airplane. The pilot held a second-class medical certificate issued on March 27, 2007, with limitations that he must wear corrective lenses. An examination of the pilot's logbook revealed that the last entry was on September 27, 2007. At that date, he had an estimated total flight time of 2,054 hours with 1,963 hours as pilot-in-command. Approximately 161 hours had been logged in the previous 90 days. Approximately 296 hours had been logged in the make and model airplane involved in the accident, with 31 hours in the accident airplane. The pilot logged 1.2 hours with 4 landings at night on September 27, 2007. The pilot logged 2 hours of actual instrument flight time, which consisted of 4 flights of 0.5 hours instrument time each in January 2004. He logged 46.7 hours of simulated instrument time; the last entry for simulated instrument time was 2.1 hours on April 3, 2006. The pilot also logged 29.6 hours in a simulator. The pilot primarily flew for Snohomish Flying Service in Snohomish, Washington. They provided a record of an instrument proficiency check on January 3, 2007. The pilot completed a flight review on April 23, 2007. The operator followed a training checklist for their pilots, and the records for the accident pilot contained blank check boxes for cross-country, instrument flight, and instrument approach. The operator reported that this indicated that they had not performed these maneuvers together with the pilot in an airplane.

AIRCRAFT INFORMATION

The airplane was a Cessna 208B, serial number 208B0415. A review of the maintenance logbook indicated an entry for a 100-hour inspection dated September 10, 2007, with a Hobbs meter time of 3,103 hours. A form listing the life limited components indicated that as of February 5, 2007, the airframe total time was 9,313.4 hours, at a Hobbs time of 2,812.3 hours. The engine was a Pratt & Whitney Canada PT6-114A, serial number PCE-19143. Total time recorded on the engine was 12,887 hours with 4,876 hours since overhaul. The Skydive Center at Star fueled the airplane with 182 gallons of jet fuel just prior to the return flight. The owner of the center reported that the pilot wanted to depart with 700 pounds of fuel per side. The pilot indicated to the owner that this was to be less than a 2.5-hour trip, and he felt that this was adequate.

METEOROLOGICAL CONDITIONS

The FAA had no record of a pilot pre-flight weather briefing from either an FAA or FAA contract facility. However, witnesses observed the pilot utilizing the internet and using the National Weather Service (NWS) web site several times prior to his departure. This site contains links to several forecast products including convection, turbulence, and icing. It also has links to SIGMET (Significant Meteorological Information)/AIRMET (Airmen's Meteorological Information) advisories. A staff meteorologist for the Safety Board prepared a factual report, which is part of the public docket. The report contained the weather conditions near the time of the accident for the departure area, route of flight, and destination. The synoptic situation indicated a cold front extending across Washington east of the accident site. The radar summary charts indicated a north-to-south band of rain showers behind the front, which extended over the accident site. The NWS weather depiction charts indicated that visual flight rules (VFR) to marginal VFR (MVFR) conditions prevailed along the route of flight. The GOES-11 infrared satellite imagery from 1930 through 2000 depicted a north-to-south band of clouds extending over the accident site with radiative cloud top temperatures from -12 to -12.5 degrees Celsius, which corresponded to cloud tops near 15,000 feet. NWS WSR-88D weather radars across the region depicted a band of echoes with reflectivity's of 15 to 25 dBZ extending over the flight track of N430A, with maximum echo tops from 10,000 to 15,000 feet of the last 3 minutes of the track. The NWS area forecast for the Cascade mountains predicted broken to overcast clouds at 7,000 feet with layers to 28,000 feet, and scattered light rain showers. There were several AIRMETs in effect for the accident area. AIRMET Sierra indicated possible ceilings of 1,000 feet and visibility below 3 miles. It also indicated mountain obscuration by clouds, precipitation, and mist. AIRMET Zulu, update 3, indicated that the freezing level was between 5,000 and 9,000 feet. It forecast moderate ice between the freezing level and FL (flight level) 240. AIRMET Tango indicated moderate turbulence below 10,000 feet. Numerous pilot reports indicated icing conditions above 10,000 feet through 18,000 feet over the region.

The NWS Current Icing Product indicated a high probability of icing conditions from 8,000 feet to 15,000 feet over the accident site. The closest official weather observation station to the accident site was Yakima, Washington, which was 34 nautical miles (nm) east at an elevation of 1,099 feet msl. At 1956, it reported: winds from 300 degrees at 14 knots gusting to 21 knots; visibility 10 statute miles (sm); skies, few clouds at 6,500 feet, broken at 12,000 feet; temperature 16/61 degrees Celsius/Fahrenheit; dew point 8/46 degrees Celsius/Fahrenheit; and altimeter 29.96 inches of mercury. Stampede Pass (KSMP), Washington, (approximately 001 degrees at 41 nm, elevation 3,959) reported at 1952: winds variable at 3 knots; visibility 1/4 sm in light rain and fog; skies, few clouds at 200 feet, broken at 900 feet, overcast 1,600 feet; temperature 4/39 degrees Celsius/Fahrenheit; dew point 4/39 degrees Celsius/Fahrenheit; and altimeter 30.04 inches of mercury. Bowers Field Airport (KELN), Ellensburg, Washington, (approximately 052 degrees at 43 nm, elevation 1,764 feet) reported: winds 310 degrees at 18 gusting to 30 knots; visibility 10 sm; skies overcast 5,500 feet; temperature 13/55 degrees Celsius/Fahrenheit; dew point 4/39 degrees Celsius/Fahrenheit; and altimeter 29.98 inches of mercury. Columbia Gorge Regional/The Dalles Municipal Airport (KDLN), The Dalles, Oregon, (approximately 172 degrees at 58 nautical miles, elevation 247 feet) reported: winds from 310 degrees at 20 knots gusting to 29 knots; visibility 10 statute miles (sm); skies, broken at 7,000 feet, overcast at 9,000 feet; temperature 17/62 degrees Celsius/Fahrenheit; dew point 11/52 degrees Celsius/Fahrenheit; and altimeter 29.99 inches of mercury. The weather for the destination airport in Shelton (KSHN) (elevation 273 feet), was: winds 240 degrees at 15 knots; visibility 10 sm; skies clear; temperature 11/52 degrees Celsius/Fahrenheit; dew point 9/48 degrees Celsius/Fahrenheit; and altimeter 30.02 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

Investigators examined the wreckage at the accident scene. The airplane came to rest in forested, mountainous terrain. The accident site debris distribution was approximately 100 feet long and 60 feet wide with the upper parts of the airplane oriented on a north heading. The structure of the airframe compressed into the principle impact crater (PIC) so that the leading edges of the horizontal stabilizers were inches above ground level. They exhibited aft crush damage. Both wings exhibited aft crush damage. The propeller and nose of the engine were about 5 feet below ground level. The engine separated into multiple pieces. The propeller hub fragmented, and the blades exhibited S-bending, blade scratching, and twisting. All major flight control components were accounted for at the accident site. Deice boots were observed on the wings, wing struts, and tail surfaces. The right aileron trim actuator measured 1.875 inches, which approximated 0 degrees deflection. Flight control cable continuity was established for the elevator trim. The elevator trim tab measured 1.45 inches on both the left and right sides, which equated to a 15-degree nose down setting. The elevator, rudder, and aileron control cables exhibited multiple separations; the cables separated in a broomstraw manner, which was consistent with an overload condition. There were no indications of wear at the point of separation. The right flap was up; the left flap separated from the airframe. The firewall, instrument panel, switch and circuit breaker panels, cockpit, cabin, and fuselage were fragmented. The cabin seats and emergency locator transmitter (ELT) were fragmented. Seat belts, an empty oxygen bottle, a stowed oxygen mask, and cased optical glasses were observed in the wreckage.

MEDICAL AND PATHOLOGICAL INFORMATION

The King County Coroner completed an autopsy on the pilot, and determined that the cause of death was multiple blunt force injuries. The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing of specimens of the pilot. Analysis of the specimens for the pilot contained no findings for tested drugs. They did not perform tests for carbon monoxide or cyanide. The report contained the following findings for volatiles: 839 (mg/dL, mg/hg) ethanol detected in liver; 73 (mg/dL, mg/hg) ethanol detected in muscle; 67 (mg/dL, mg/hg) ethanol detected in kidney; 16 (mg/dL, mg/hg) ethanol detected in lung; 2 (mg/dL, mg/hg) acetone detected in lung; 1 (mg/dL, mg/hg) isobutanol detected in liver; 2 (mg/dL, mg/hg) isopropanol detected in lung; 2 (mg/dL, mg/hg) N-butanol detected in liver; and 2 (mg/dL, mg/hg) N-propanol detected in kidney. The report noted putrefaction. The pilot resided in Massachusetts, and spent the summer flying in the Seattle area. The owner of the airplane stated that they didn't use oxygen, so they did not service the system. However, they kept two masks in the airplane. The duration of the flight was about 2 hours 8 minutes. Radar data indicated that over 6 ½ minutes of the flight occurred between 12,500 feet and 14,000 feet. Over 1 hour 7 minutes occurred at 14,000 feet and above. According to an aviation medicine textbook (Gradwell, D.P. 2006. Hypoxia and Hyperventilation. In: Ernsting's Aviation Medicine, Fourth Edition, Eds. D.J. Rainford and D.P. Gradwell. Hodder Arnold, London, U.K. p. 53), from 10,000 to 15,000 feet, an

individual without supplemental oxygen "exhibits no or few signs and has virtually no symptoms [of hypoxia]. The ability to perform skilled tasks is impaired, however, an effect of which the subject is frequently unaware." The FAA Aeronautical Information Manual, paragraph 8-1-2, "Effects of Altitude," describes hypoxia as "a state of oxygen deficiency in the body sufficient to impair functions of the brain and other organs." The textbook also notes that "an individual breathing air at 8,000 feet may take significantly longer to achieve optimum performance at novel tasks than is the case at sea level. For example, this degree of hypoxia has been found to double the reaction times of initial responses to a complex choice-reaction task as compared with responses at sea level. The intensity of this effect increases with altitude and complexity of the task - markedly so above 12,000 feet." (Gradwell, 2006, p. 51). Studies also noted that research subjects exhibited mental performance impairment during task tests that were begun after only 5 minutes (Kelman, G.R.; Crow, T.J. 1969. Impairment of mental performance at a simulated altitude of 8,000 feet. In: Aerospace Medicine 40(9). pp. 981-982) and 10 minutes (Denison, D.M.; Ledwith, F.; Poulton, E.C. 1966. Complex reaction times at simulated cabin altitudes of 5,000 feet and 8,000 feet. In: Aerospace Medicine. pp. 1010-1013. October 1966) of exposure to a simulated altitude of 8,000 feet. Federal Aviation Regulation (FAR) 91.211 governs the use of supplemental oxygen. It states that the required minimum flight crew must be provided and use supplemental oxygen for that part of the flight that is of more than 30 minutes duration at cabin pressure altitudes above 12,500 feet msl up to and including 14,000 feet msl. At cabin pressure altitudes above 14,000 feet msl, the required minimum flight crew must be provided with and use supplemental oxygen.

TESTS AND RESEARCH

The wreckage was recovered from the accident site and further examinations were accomplished at Avtech Service in Kent, Washington, on December 13, 2007. The propeller hub fractured into several pieces at impact and all three blades separated. The two blades that were in the primary impact crater and the third blade that was about 15 feet away and several feet underground were examined. Blade A had leading edge polishing, and trailing edge gouges. The outboard 12 inches of the blade separated, and was curled; the fracture surface was angular and irregular. The blade twisted toward the low pitch, high revolutions per minute (rpm) position; the lug separated. Blade B bowed forward twisted toward the low pitch, high rpm position, and had leading edge polishing. On blade C, the lug separated, and the leading edge twisted toward the low pitch high rpm position. It had leading edge gouges, and trailing edge buckling. Severe impact and fire damage precluded formal disassembly of the engine. Disassembly was limited to sectioning the gas generator case and exhaust duct with a powered carbon rotary disc, and separating the power section for access to the turbine section. The compressor rotor and stators, the No. 2 bearing housing, the compressor turbine shroud, the compressor turbine, the power turbine guide vane ring, the power turbine shroud, and the power turbine displayed heavy circumferential rubbing and machining. The Pratt & Whitney investigator attributed this to their making contact with their adjacent components under impact loads and external housing deformation. The reduction gearbox 1st stage coupling fractured in torsion due to impact loads. There were no indications of any pre-impact distress or operational dysfunction to any of the engine components examined. All personal gear recovered from the site was weighed. For computational purposes, the passengers' weights were distributed to optimize the most forward center of gravity (CG). The Cessna investigator determined that the airplane was under its certified maximum gross weight, and that the center of gravity was within limits throughout the flight.

Performance Study

A Safety Board specialist used recorded radar data to study the airplane's performance; the study is part of the public docket. It attempted to describe, to the extent possible, the airplane's motion during the flight using various data sources. Due to inherent limitations in the various input data sources and assumptions that had to be made, the results presented in the study are only estimates. Pertinent parts of the study follow. The study indicated that the airplane was changing altitudes and turning before making an abrupt 360-degree turn, and lost over 10,000 feet in 2 minutes. The descent rate approached 8,000 feet per minute (fpm). The last target was at 8,900 feet at 1959:40. One of the three radar sites used appeared to have captured the first sign of the airplane stalling about 1957:33. Therefore, the specialist used data from only one radar site in the performance calculations, and these were limited to the time prior to the stall. During the last 360-degree turn, there were several other indications of the airplane approaching a stall followed by recovery. The airplane appeared to completely depart controlled flight around 1959. The specialist used simulator data for airplane lift, drag, and side-force in comparison calculations. One goal was to help determine whether the airplane may have been operating in icing conditions.

The calculated angle-of-attack history with no ice showed that the accident flight was very close to or beyond stall. If there had been significant ice present on the airplane, the specialist felt that the radar data would likely have recorded a departure from controlled flight sooner than 1957:33. The study also noted that it required 620 shaft horsepower (shp) to trim the C-208B in the simulation at the accident conditions. This was close to the sea level 675 shp maximum power rating of a new PT6 engine before any losses due to normal wear. This high power requirement was consistent with a Cessna C-208B being operated close to its design limit and with very little maneuver margin. The specialist used flight lift and other flight-test validated, non-linear C-208B aerodynamic data from a simulator company to recreate the accident flight in simulation. He compared stand alone checkout data with flaps retracted to the simulation results to ensure that the C-208B aerodynamic data were properly implemented in the NTSB simulation. The comparison indicated that the simulation results were valid and consistent with a C-208B operating close to the accident conditions. In summarizing the findings, the specialist noted that the airplane's radar target had just entered an area of green intensity weather (30 dBZ according to the chart's legend), and was turning when the radar site captured the departure from controlled flight. The performance study showed that the angle-of-attack at this point in the flight was increasing rapidly, and that the departure from controlled flight was consistent with an aerodynamic stall.

ADDITIONAL INFORMATION

The owner of the airplane indicated that it was placarded with "Not approved for Known Icing." He didn't keep the window deice plate on the airplane. He made it their policy to not fly in icing conditions at all. All deice equipment was working previously according to the owner. The autopilot was working well, as was the Global Positioning System (GPS) moving map. The owner indicated that the pilot had about 30 hours in this particular airplane, and was familiar with it and its systems. The owner is a certified flight instructor and had flown with the accident pilot previously. He indicated that the pilot flew well even in an airplane that was new to him. They discussed the flight to Idaho and back; this included flying north of Mt. Ranier if need be, since the minimum enroute altitude (MEA) was lower on that side of the mountain. The pilot didn't express any concerns about flying in instrument conditions. Another pilot for Kapowsin indicated that he talked to the accident pilot about noon on the day of the accident. The pilot had planned to leave about 1630, but was going to delay until 1930. They discussed two routes; Ellensburg to Seattle and White Pass to Shelton, and noted that the latter's MEA was 10,000 feet. A check pilot for Snohomish Skydive indicated that they operated VFR only, and did not go into clouds. He said that the accident pilot was diligent about checking weather on the computer, and would not plan his flight to go into the clouds. One skydiver on the flight had called him from Star to indicate that they were waiting out the weather. The check pilot indicated that the pilot was under no pressure to return to Shelton that night, and would not have hesitated to stop at Yakima or another intermediate point if necessary. Astronomical conditions indicated that sunset was at 1845, and the end of civil twilight was at 1915, with the sun approximately 14 degrees below the horizon. The moon was more than 20 degrees below the horizon with only 8 percent of the disc illuminated.
Updated on Jun 22 2009 3:18PM

NTSB Probable Cause Report

The pilot was returning a group of skydivers to their home base after a weekend of skydiving. He flew several jump flights, and then stopped early in the afternoon to prepare the airplane for the flight home. The flight was planned into an area of clouds, turbulence, and icing, which the pilot had researched. He delayed the departure until he decided that he could complete the planned flight under visual flight rules (VFR). The accident occurred at night with little illumination of the moon, and the airplane was in an area of layered clouds. A detailed analysis of the weather conditions revealed that the flight probably encountered broken to overcast layers both below and above its flight altitude. The satellite and sounding images suggested that it was possibly in an area of mountain wave conditions, which can enhance icing. The recorded radar data indicated that the pilot was likely maneuvering to go around, above, or below rain showers or clouds while attempting to maintain VFR. The airplane likely entered clouds during the last 3 minutes of flight, and possibly icing and turbulence. It was turning when it departed from controlled flight, and a performance study showed that the angle-of-attack at this point in the flight was increasing rapidly. The study determined that the departure from controlled flight was consistent with an aerodynamic stall. The unpressurized airplane was flying at over 14,000 feet mean sea level for more than 1 hour during the flight. It reached 15,000 feet just prior to the accident in sequential 360-degree turns while climbing and descending. Supplemental oxygen was not being used. At these altitudes, the pilot would be substantially impaired by hypoxia, but would

have virtually no subjective symptoms, and would likely be unaware of his impairment. The pilot had logged over 2,000 hours of total flight time, with nearly 300 hours in this make and model of airplane. He was instrument-rated, but had only logged a total of 2 hours of actual instrument flight time. Company policy was to fly under visual flight rules only, and they had not flight-checked the pilot for instrument flight.

The National Transportation Safety Board determines the probable cause(s) of this accident as follows. The pilot's failure to maintain an adequate airspeed to avoid an aerodynamic stall while maneuvering. Contributing to the accident were the pilot's impaired physiological state due to hypoxia, the pilot's inadequate preflight weather evaluation, and his attempted flight into areas of known adverse weather. Also contributing were the pilot's inadvertent flight into instrument meteorological conditions that included clouds, turbulence, and dark night conditions.

Unit 7
Subject Categories
Aircraft – Chester Gap

Objective: Demonstrate the ability to use radar data to determine areas of high probability in which to deploy ground resources.

Secondary objective: (Optional) Describe when sufficient information has been obtained to begin a ground search for a missing aircraft.

Text Reference: Page 99-105

Additional Reference: *Data Collection and Analysis for NASA World Wind Search and Rescue Visualization Program* by Robert J. Koester in Instructor Resource DVD

Suggested Software: Netica which can be downloaded from:

<http://www.norsys.com/download.html>

The Instructor Resource DVD had a copy of the software but several students reported it did not load correctly. Once the software is installed click on limited mode since no password or purchase is required to run the model. The file that must be opened is 8 byhand_simpler.dnet That file is found in the Instructor Resource DVD in the same directory as the PowerPoint visuals for the two-day version of the course. As a back up, a PowerPoint screen shot as been made of the software showing the required information for this particular case study.

Instructor's Notes: This exercise may be presented in several different ways depending upon which educational elements the instructor decides to stress. The major objective is to become familiar with radar information, extract useful information, use probability models to determine likely areas, and to integrate terrain analysis to determine where to deploy ground resources. The secondary objective is to present investigation and when it is appropriate to launch a ground search effort. The instructor also needs to determine if they want the students to actually plot radar data onto the topographic map, or if the plots will be given to the students. In the second phase it requires the students to plot NTAP points onto a topographic map in a fashion that provides useful graphical information. The final phase requires the students to analyze the information and determine how to deploy ground resources.

During the first phase students should be given the initial scenario, aircraft incident report, and a copy of the flight plan. The instructor should lead a brief class discussion. This discussion should include; can a ground effort be launched at this time? What type of further investigation can be conducted? Would a unified command between air and ground resources be appropriate at this time? What is the difference between VFR and IFR flight? What type of electronic aids to navigation do many VFR and IFR pilots use? What is scud running?

After the discussion the students may be told that an airport manager remembered that a similar plane had refueled at his airport after hearing news reports of the search effort. He then went through gas receipts and found one with the pilot's name. This information allowed a NTAP data to be obtained because of both a known time of takeoff with a known location. During the second phase the students should receive a copy of the NTAP plots, the coordinates of the last several NTAPs. If the instructor decides the student should plot the coordinates then the instructor should use a laminated copy of the Chester Gap 7.5 quadrangle. The map problem is

normally conducted by simply giving the students the radar plots already plotted onto the tabloid sized map. The instructor should also gently prompt the students to calculate the airspeed between each plot. The tabloid sized map does not contain sufficient space to show the last ghost plot. While this greatly simplifies the exercise and reduces the amount of time required it does deprive the students and instructor the opportunity to discuss ghost plots and see the process of attempting to determine if the last plot is a ghost or cruise plot.

In phase three of the exercise the students should determine where they wish to deploy resources. During the initial five hours of daylight, cloud conditions do not permit aerial searching. The instructor should also lead a discussion at the end of the exercise

Additional Reference Material: The National Transportation Safety Board (NTSB) report for this incident has been added as a download.

Scenario: A Cherokee Six single-engine plane with five people on-board departed from Manteo Regional Airport (Kitty Hawk, North Carolina) on August 16 to return home to Delaware, Ohio after a family vacation. The plane was not reported missing until August 18 by the pilot's ex-wife. No ELT signals or SRSAT hits have occurred in the flight path. The pilot was flying VFR and did not file a flight plan. On August 16th thunderstorms and low ceilings occurred throughout Virginia.

Assignment one: Participate in the discussion led by the instructor.

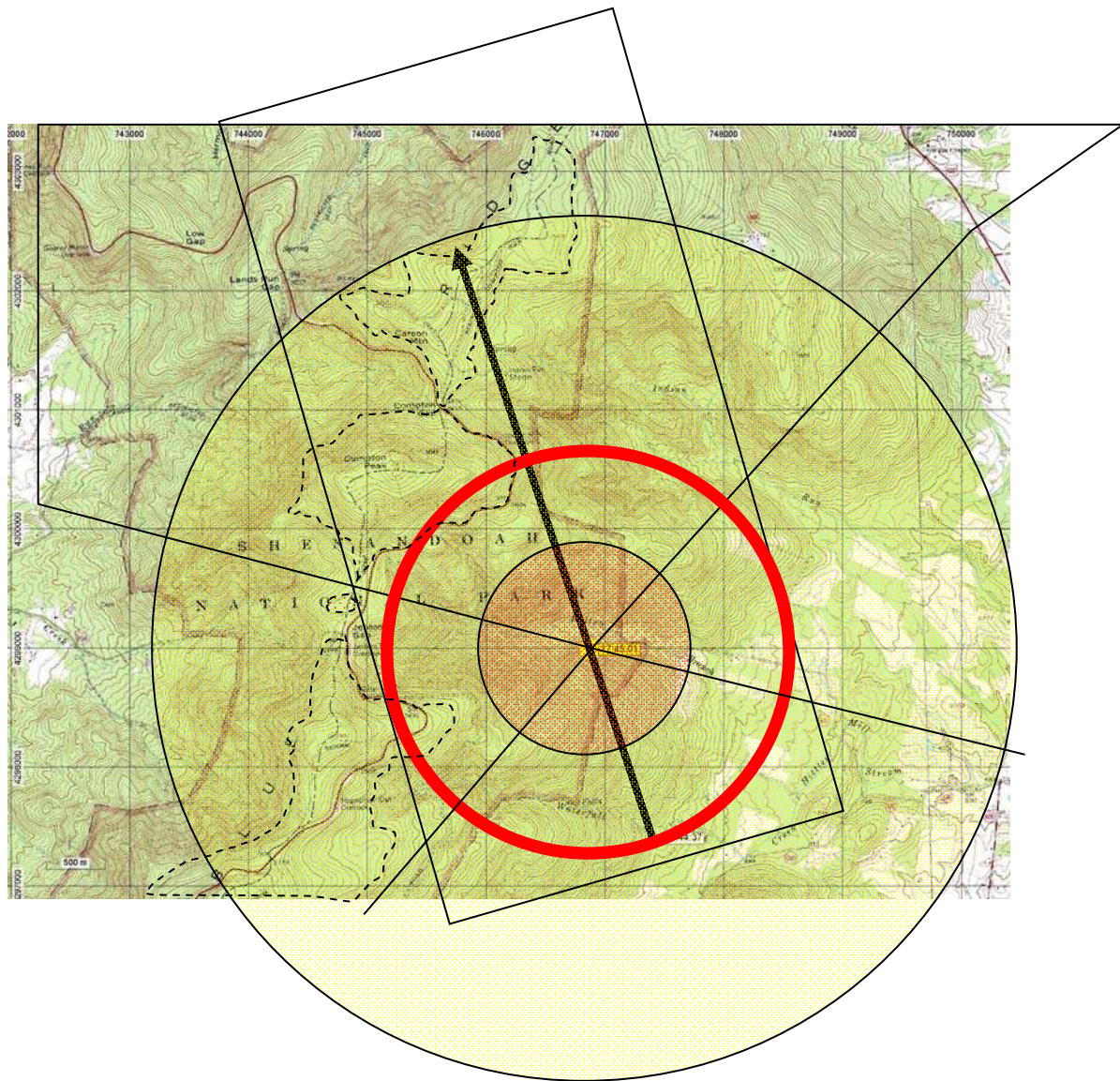
Assignment two: Plot the information given to you in the manner that allows you to extract the most possible information.

Assignment three: Determine how to deploy resources given:

- One helicopter (not available until ceiling lifts)
- Five complete CAP flight crews in Cessna 172s. (also grounded)
- 6 ground team leaders
- 42 ground team members
- State SAR coordinator
- 3 Park Medics, full logistical support, Incident Management team

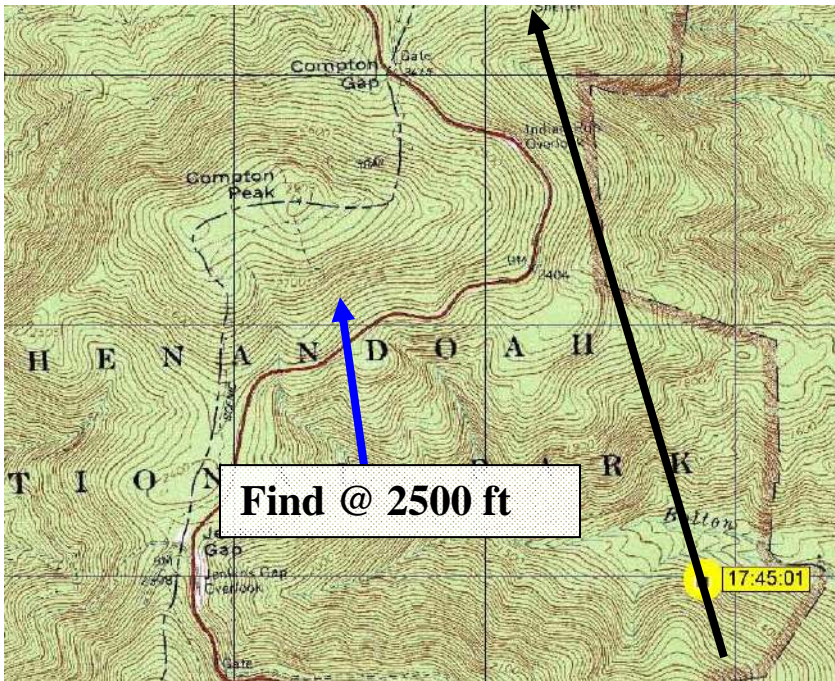
Required Materials:

Student handout (I)
Chester Gap 7.5 quadrangle
Chester Gap map of relevant sections
Find map



The time stamp of 17:45:01 represents the last radar plot which also reported an altitude of 2400 feet. The black arrow is drawn from the second to last radar plot through the last one and continues. Using the Bayesian model (shown on previous PowerPoint slide) the orange area around the last plot has a 38.2 percent chance of containing the aircraft, the yellow circle goes out 2 nm and has a 57% chance of containing the aircraft. The red circle represents where the plane would be expected to be in twelve seconds which represents the interval of radar reported positions. The plot offset shown by the green box of 1 nm has a 51% chance of containing the aircraft. The angle of dispersion of 60 degrees has a 64% chance of containing the aircraft. The orange areas represent the 2400 contour interval. This terrain would be higher than the elevation the aircraft was flying at. This slide may be shown to the class if the participants

The aircraft was found when the ceiling lifted and the helicopter could become airborne. It quickly located a large burn area which contained the crashsite.



Excerpt from NTSB Factual Report

HISTORY OF FLIGHT

On August 16, 1994, at 1346 eastern daylight time, N3701W, a Piper PA-32-260, owned and operated by WHP of Powell, Ohio, crashed while en route to Delaware, Ohio. Instrument meteorological conditions prevailed at the accident site, and a flight plan was not filed. The certificated private pilot and his four passengers were fatally injured. The aircraft was destroyed. The flight was operated under 14 CFR 91. The flight originated in Manteo, North Carolina.

The pilot made a fuel stop at Shannon Airport, Fredericksburg, Virginia, where he refueled en route to his destination in Ohio. The airplane collided with trees in mountainous terrain during cruise flight about 11 miles southeast of Warren County Airport, Front Royal, Virginia. According to the FAA, the pilot received a weather briefing which indicated marginal VFR and IFR conditions along his route of flight.

A witness who was at the 2300 foot level of the 2900 foot high mountain stated that the airplane was flying low over the mountains. The witness stated that it was foggy at the time and that the clouds had obscured the mountains. Shortly afterward, she heard what was later determined to be the sound of the collision.

The airplane was reported overdue. Search personnel found the wreckage eight days later at an elevation of about 2500 feet MSL on the top of Compton's Peak.

The accident occurred during the hours of daylight, at 38 degrees 49 minutes North and 10 minutes 24 seconds West.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with single engine land rating. The pilot did not possess an instrument rating. His logbooks were not located and his last record of flight time was on his application for a Class III Medical Certificate dated July 7, 1993. At that time he reported 250 hours of flight time.

AIRCRAFT INFORMATION

The 1966 year model Piper PA-32-260 airplane, serial No. 32-614 was powered by a Lycoming O-540-E4B5 engine, serial No. L-1758- 48C. The airplane log books were not located; however, maintenance records showed the airplane completed an annual inspection on June 4, 1994, and at that time had accumulated over 3139.7 hours of total flight time. The engine records indicated that the aircraft had over 1593.77 hours since major overhaul.

METEOROLOGICAL CONDITIONS

The 1253 hours surface weather observation for Washington National Airport, Washington, DC, about 63 miles east of the accident site was as follows:

Sky condition, 900 feet scattered, Ceiling measured 1700 feet broken; visibility, 2 miles in heavy rainshowers and fog; temperature, 68 degrees (F); dew point, 66 degrees (F); wind condition, 180 degrees magnetic at 18 knots; and altimeter, 30.22 inches Hg.

WRECKAGE AND IMPACT INFORMATION

The aircraft collided with trees in mountainous terrain oriented on a 310 degree magnetic heading. The wreckage was strewn a distance of about 300 feet. The first piece of wreckage along the wreckage path was the outboard section of the right wing. About 25 feet from the outboard section wing was the right wing tip. Approximately 15 feet from the right wing tip was the left wing. At the top of the hill about 35 feet from the left wing was the horizontal stabilizer and fuselage relatively intact. The cockpit, instrument panel, left landing gear and nosewheel were destroyed by fire.

One of the two bladed propeller blades was melted. The other blade revealed evidence of heat damage and it exhibited twisting and bending. The tip of the blade exhibited leading and trailing edge damage.

The engine was recovered from the accident site and transported to Dawn Aeronautics, New

Castle, Delaware, for examination on September 23, 1994. The examination revealed that the engine sustained impact and fire damage. All six cylinders remained attached and secured to the crankcase. The oil sump was melted. The accessory housing and the numbers 1,3 and 5 cylinder heads were melted. The pistons for the number 3 and 5 cylinder were visible from the outside of the engine. The right magneto sustained fire and impact damage and could not be tested. The left magneto separated from its mounting pad and sustained fire damage. The ignition harness for the magneto was attached to the engine. The magneto when rotated by hand produced a spark at one magneto distributor block tower.

The exhaust valve stems of the number 3 and 5 cylinders were broken. The valves were bent. Both cylinders sustained fire damage. The number 4 cylinder sustained fire damage and was difficult to remove. The number 4 piston and valves were intact. The accessory housing was removed. The oil pump sustained heat damage. The accessory drive gears with the exception of the right magneto drive gear were intact. The right magneto drive gear was bent. The crankshaft gear was attached. The examination did not reveal any preexisting mechanical failures.

MEDICAL AND PATHOLOGICAL INFORMATION

A post-mortem examination of the pilot was conducted by Jerry W. Martin, Medical Examiner of the Commonwealth of Virginia, on August 26, 1994. Toxicological tests were completed by the Civil Aeromedical Institute of the FAA in Oklahoma City, Oklahoma. According to the toxicological report .09% liver-alcohol, and .022% urine-alcohol was detected. The report indicated "marked putrefaction" condition of the specimen. [note: it is expected that if a body has been in a state of putrefaction that alcohol is a natural by-product of the decomposition process and does not necessarily mean the subject had ingested any alcohol. – RJK]

Excerpt from NTSB Probable Cause Report

THE PILOT'S FAILURE TO MAINTAIN ADEQUATE CLEARANCE, HIS IMPROPER IN-FLIGHT DECISION AND HIS INADVERTENT FLIGHT INTO INSTRUMENT METEOROLOGICAL CONDITIONS (IMC) WHICH RESULTED IN IN-FLIGHT COLLISION WITH TERRAIN. THE HIGH TERRAIN AND WEATHER CONDITIONS WERE CONSIDERED TO BE FACTORS.

Image of Aircraft type: Not of actual aircraft.



Unit 7
Subject Categories
Autistic
South Williamsport

Objective: Demonstrate behavioral characteristics of autistic subjects.

Text Reference: Autism – Page 115 - 119

Instructor’s Notes. On December 18 a 9-year-old male with Autism was last seen at his residence at 5 p.m. He was watching television with his siblings. He was wearing a long-sleeved shirt, blue jeans, and slippers. He was not wearing a coat or hat. The following night temperatures dropped 15 degrees F, the following day temperatures remained below 20 degrees F. The search involved over 350 personnel with a large percent of emergent volunteers and a substantial non-coordinated volunteers. Most of the initial efforts were directed to the town of South Williamsport itself where a sighting had placed him at the local McDonalds. Since the sighting was made by the son of the Chief of Police it was given more weight than might otherwise occur.

The subject had severe autism, was non-verbal, described by parents has hyper-active. He was attracted to lights. The subject was found deceased (the only fatality currently in the database – a second fatality from Canada will go into the database for 2009.)

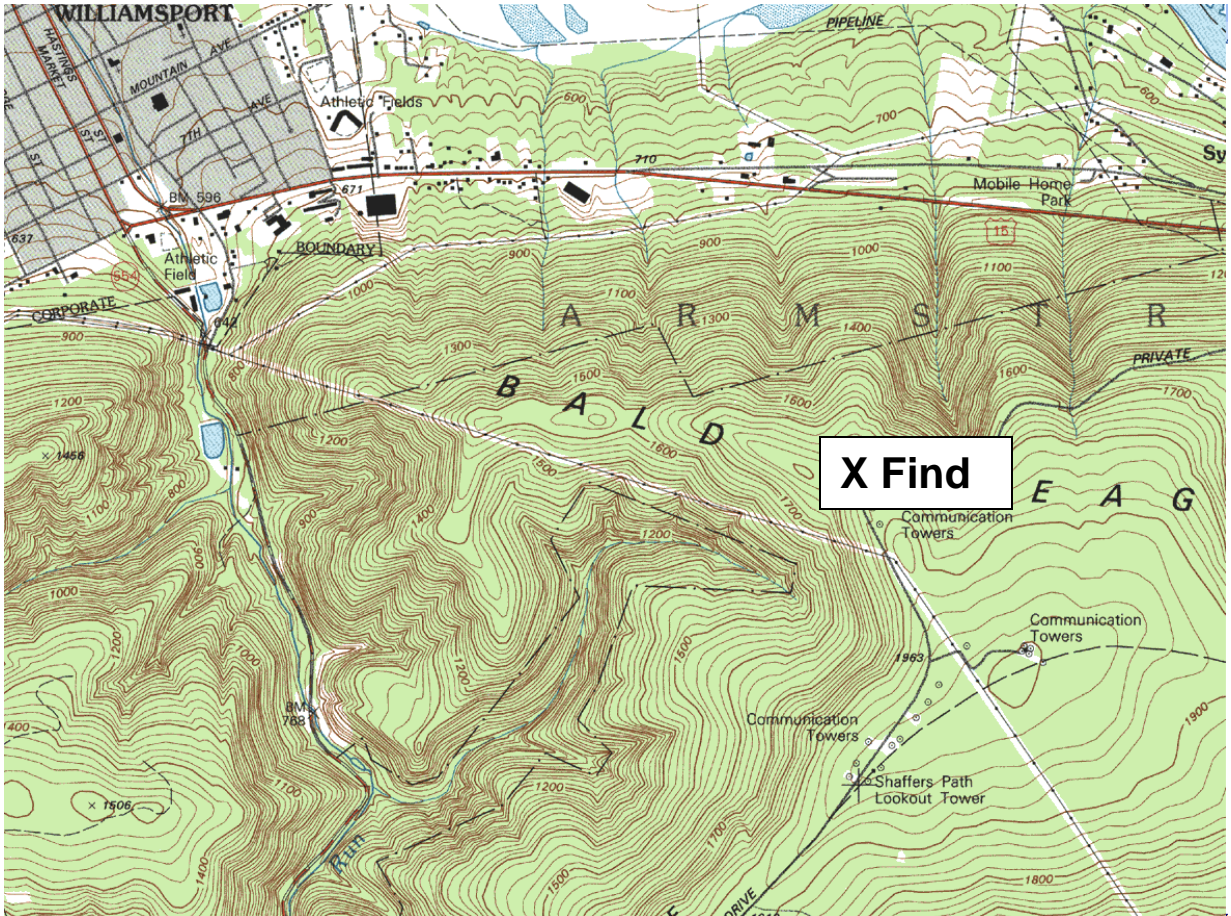
The instructor should present the basic scenario and ask the participants what additional investigative information they would like and also what actions they would like to take. As with most map scenarios “What do you want to know, where do you want to go.” The key points are being attracted to lights and students doing a structure search. He was found after 58 hours of searching 12 meters away from the radio towers. He was found dead by a searcher doing independent searching (i.e. not part of the formal search effort).

Scenario: A 9-year-old male with severe Autism is last seen in his residence at 5 P.M. on December 18. He was watching television with his siblings. He was last seen wearing a long-sleeved shirt, blue jeans, and slippers. He was not wearing a coat or hat. The temperature is currently 25 F (-4 C). Conditions are clear with a 15 mph (24 kmph) wind.

IPP: 41.220542 N., 076.986436 W

Find: 41.219054 N., 076.957483 W (WGS84)

Topographic Map: Mountoursville South, Pennsylvania, USA



What Actually Happened:

USA Today – Posted 12/20/2004

Hundreds search for missing autistic boy

SOUTH WILLIAMSPORT, Pa. (AP) — Hundreds of volunteers searched for a missing 9-year-old boy as dropping temperatures made the worries increase.

LM, who is autistic and unable to speak, was last seen around 5 p.m. Saturday wearing a long-sleeved gray shirt, blue jeans and brown slippers. His siblings told police he had been watching TV with them before he disappeared and was not wearing a jacket. He remained missing early Monday, a Lycoming County emergency dispatcher said.

"We're hoping he found someplace warm," South Williamsport Police Chief Rexford Lowmiller said. Temperatures dropped to 15 degrees Sunday night, with winds making it feel close to zero, and forecasters predicted that the temperature would remain below 20 degrees on Monday.

By Sunday afternoon, more than 350 people had signed up for search parties, working under directions from a command post set up at a fire station.

Volunteers were put in groups of 10 to 15 and assigned a portion of the search area.

For safety reasons, only emergency personnel were asked to continue searching after dark, Lowmiller said, using thermal imaging cameras and night vision goggles. But many others continued to search without guidance from the command post.

"What we are suggesting to people who want to continue to help," Lowmiller said, "is that they search their own property, and if their neighbor isn't home, or is elderly, search their yard, too."

He suggested people search anywhere where someone might seek shelter from the weather, such as under porches and in sheds and garages.

Unit 7
Subject Categories
Autism
Dolly Sods

Objective: Demonstrate behavioral characteristics of autistic subjects.

Text Reference: Autism – Page 115 – 119

Instructor’s Notes: The map problem is from a dramatic four-day search. The map problem can be conducted as a class, in groups, or individually. Since it is the second autism map problem if time allows it should be done differently than the South Williamsport problem. It is suggested to conduct the South Williamsport problem as a class and conduct this problem in groups. Investigative questions may be conducted as a class.

The actual key to success during this incident was a combination of understanding decision points, statistics, and the importance of POD. It took placing several teams into the correct area to make the eventual find.

On the first slide, the instructor should present the overall scenario and show the route. The instructor should mention a total of five slides will be shown prior to starting the actual investigation and deployment aspects of the map problem. The solid blue line shows the location of the actual trail. The dashed black line on the USGS topographic map is no longer accurate in some locations. Indeed, the sharp bend that is the important decision point did not appear on the topographic map.

The second slide shows the route using Goggle Earth imagery.

The third slide shows the trail network of the surrounding area

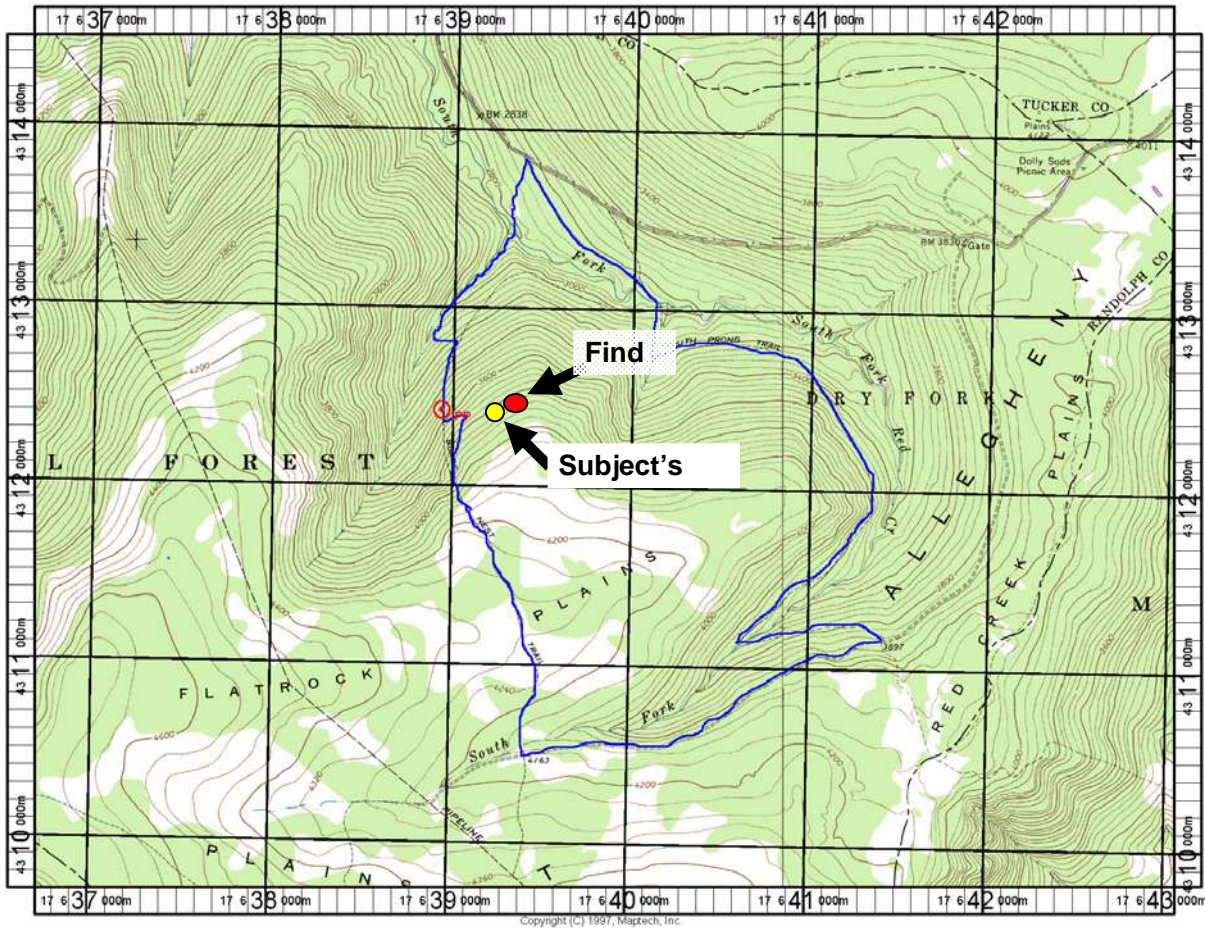
The fourth slide shows a close up of the IPP and the sharp bend in the trail. The IPP is where his father saw him turn left (they were hiking south up the Boars Nest Trail). When the father turned the corner he no longer saw his son.

The fifth slide is the same as the first slide. It shows the overall route again. The instructor may elect to make either a letter size map or a tabloid sized map to show more of the wilderness area. The PowerPoint slide is based upon the letter size map. The tabloid sized map is preferred. On the first click is appears nothing happens. This is done to hide the find location if an instructor elects to make slide handouts. The next click will reveal the location of the subject’s hat which was found. The final click will reveal the find location.

Scenario:

On Sunday October 14 an 18-year-old male with severe Autism went hiking with his parents in the Dolly Sods Wilderness Area in West Virginia. He is unable to communicate verbally and has a mental age of a 3-4 year old child. While he resides in a nearby city he frequently

hikes with his family. It is not uncommon for him to run ahead and he has been missing for short periods before that the family was always able to resolve. The intended route was to start at the trail head on Forest Service Road 19 (not marked on the topographic maps but listed on Google Earth software). They took the Boar's Nest Trail (2.53 miles) South climbing to the Flatrock Plains. They then intended to take the South Fork Fire Road (FR70) east (1.34 miles) to the South Prong Trail. They would then follow the South Prong Trail Northwest for 3.73 miles back to the trailhead. The total circuit hike would have been 6.6 miles. The weather is unseasonably warm (70 degree F highs). He does not carrying any supplies and is dressed for 50 degree weather.



IPP: 38.9492450 N., 79.3965479 W. (WGS84)

Topographic Map: Laneville and Hopeville, West Virginia USA

Lesson's learned:

Importance of searching area multiple times. It appears that teams were all quitting in just about the same location. Just short of the subject. GPS of search teams would have helped. Subject was non-verbal making the search much more difficult. On the day he was found teams were shouting out they had ice-cream. Which seemed to help.

Published: October 19, 2007 10:59 pm timeswv.com

It's likely no one will ever know hiker's story

Autistic teen released from hospital after his four-day ordeal

By Kelley Schoonover

Associated Press Writer

CHARLESTON — It's likely no one will ever know what Jacob Allen went through during the four days he was lost in West Virginia's Dolly Sods Wilderness. He can't tell them.

The 18-year-old from Morgantown is autistic and nonverbal. He uses body language and pictures to communicate with his family. If he wants to eat a hot dog, he points to a picture of a hot dog; If he wants to go hiking, there's a picture for that as well, Chris Stadelman, a spokesman for the search effort, said Friday.

"The most frustrating thing, given how well this went, is that we don't have any idea and probably won't have any idea" about where he went or what he did, said Stadelman. "Ultimately we don't care if we know where he was because we know where he is. That's home."

As his 22-year-old sister Brittany waved to onlookers, Allen was rolled out of Davis Memorial Hospital in a wheelchair Friday afternoon. Stadelman said the wheelchair was probably just a precaution because Allen was given a "clean bill of health."

"We are just relieved and just so happy, happier than in the past couple days, that's for sure," Allen's 14-year-old brother Micah told The Associated Press Friday morning.

Allen said his brother is "obviously 10 times happier. You can tell he's happy to be with us."

From what rescue crews have been able to piece together, Jacob Allen didn't stray too far from where his parents lost sight of him Sunday while hiking the Boar's Nest Trail in the Randolph County section of the wilderness area.

He was found — hungry and thirsty but otherwise in good shape — on Thursday afternoon, less than a mile from where his hat had been found on Monday. He was curled up asleep, beneath the protective canopy of a mountain laurel and rhododendron.

"He had been in that area, not in specific location, but in that general area (the whole time)," said State Police 1st Sgt. Jim Wise, who helped carry Allen out of the woods.

"I don't think he had eaten or had water for several days, as far as we could tell, because he wasn't near any type of water source," said Wise.

Hundreds of volunteers and trained professionals had been combing the woods, promising candy and food for the boy many called Jake.

"Everyone kept saying 'Jacob, we have some ice cream for you,'" said Karen Allen during a Friday interview with ABC's Good Morning America. After he was found, "everyone up there said 'Shoot! We told him we have ice cream but we don't have any.'"

Allen's hunger was evident to the rescuers when they did find him. He had eaten two peanut butter and jelly sandwiches before he was even out of the woods, his mother said.

Later that night in the hospital, he wolfed down some broth and Jell-O, said Stadelman, who added that before he was released, Allen also ate chicken and french fries, french toast, bacon and oatmeal.

And Allen finally got that ice cream. Stadelman said he had not one, not two, but three servings.

4-day search ends happily for hiker

Friday, October 19, 2007

By Anya Sostek, Pittsburgh Post-Gazette



Kelly Stadelman/The Parsons Advocate

Canaan Valley Fire Department Chief Sandy Green, right, hugs Jim Allen after telling him his son, Jacob, had been found.

LANEVILLE, W.Va. -- Desperation turned to jubilation yesterday afternoon when a volunteer rescue team stumbled upon 18-year-old Jacob Allen resting in a mossy mountain clearing.

Mr. Allen, who is severely autistic, had gone four days without food or water after wandering away from his parents during a hike Sunday afternoon in West Virginia's Dolly Sods Wilderness Area. The Morgantown resident cannot communicate verbally and has the mental capabilities of a 3- to 4-year-old child. "It really is a miracle," said Chris Stadelman, spokesman for the rescue effort.

Though thirsty, hungry and fatigued, Mr. Allen was in good enough condition to walk with assistance part of the way out of the forest. He was kept last night for observation at a local hospital, where doctors were feeding him Jell-O and broth and treating him for dehydration.

Jeremy Reneau, 25, had been searching an area of dense laurel thicket for several hours yesterday when he came upon Mr. Allen lying down in a mossy clearing. Mr. Allen had taken off his shoes, and when Mr. Reneau called out his name, he rolled over in response.

He was shivering and his socks and windbreaker were wet, said Emil Lehosit, another member of the nine-man search crew that found him. Mr. Reneau, a physician's assistant in Grafton, W.Va., did a quick physical examination and found that Mr. Allen did not have a fever and all of his vital signs were stable.

The rescuers gave him several bottles of Gatorade and water, as well as butter, candy bars and sandwiches that they had on hand.

"You name it, that boy was eating it," said Mr. Lehosit, a restaurant owner in Clarksburg, W.Va.

Mr. Allen seemed grateful to be found and happy to be around people again, said Mr. Reneau.

Given the landscape and the length of time Mr. Allen went without food and water, officials at the site were amazed by the fact that he seemed "no worse for the wear," said state police Capt. M.J. Trupo.

"What a physical specimen that kid is," he said. "They found him closer to the top [of the trail] than the bottom. He went uphill, and that's pretty rough terrain."

Mr. Allen liked to be outdoors and often hiked with his parents or his brother. He liked to stay ahead of the group, and while he had wandered off several times before, he had always been found immediately.

The area where he was found yesterday had been searched five or six times during the four days that Mr. Allen was missing, said Don Scelza, coordinator for Appalachian Search & Rescue, but dense underbrush limited both the mobility and the sight lines of the searchers. It is not uncommon to have to search an area multiple times before someone is found, he said.

"You had to be right on top of him or you wouldn't have seen him," said Mr. Lehosit.

Rescue workers repeatedly sent search crews to that particular area, in part because dogs keyed in on scents there during night searches. Mr. Allen was found about half a mile from the spot where searchers came upon his hat Monday.

When the search team radioed to the command center that Mr. Allen was alive and mobile, "hooting and hollering" erupted among family and rescue personnel, said Capt. Trupo. Mr. Allen's grandfather formed a massive prayer circle as those at the command center cried and hugged each other, said Mr. Stadelman.

With assistance from the rescue team, Mr. Allen was able to walk for a short way until he sat down from fatigue and rescuers waited for a stretcher to be brought from the command center.

The terrain in the area was so steep and dense with brush that teams of eight rescue workers had to take turns carrying Mr. Allen back to civilization. From the time that Mr. Reneau saw the lost young man's blond head at 2:15 p.m., it took about 2½ hours to get him back to the command center -- a distance of less than two miles.

Searchers viewed yesterday as a "high urgency day" because weather forecasts called for rain and cooler temperatures last night, said Mr. Stadelman. The unseasonably warm and dry weather conditions during most of the search were a "blessing" that rescuers also credited for Mr. Allen's survival.

The Rev. Tim Haring, the Allen family's pastor, said the family was extraordinarily grateful to all the volunteers and wanted to say, "Thank you, thank you, thank you" for their efforts.

Nearly 350 volunteers turned out yesterday to help search -- the biggest total in the four-day effort.

While many, including Mr. Lehosit and Mr. Reneau, searched for the first time yesterday, others had been in the forest the whole time. Alan Holmes, a University of Maryland student who served as the staging officer as part of the Potomac Valley Rescue Group, estimated that he'd gotten six hours of sleep over the last four days.

Mike Woelfel, a juvenile court judge in Huntington, W.Va., drove about 200 miles with his dog, Chevy, to help with the search. He feared the worst for Mr. Allen, but was amazed by the high spirits and optimism of the other searchers.

When word spread that Mr. Allen was found alive, the reaction was not shock, he said, but relief. "Everyone expected that little guy was going to be OK."

Word of the rescue made it to Morgantown High School yesterday afternoon, after most of the 1,700 students had left for the day. Mr. Allen lives near the high school, in the South Park neighborhood, and attends special classes there.

Assistant Principal John Lewis announced it on the public-address system about 5 p.m. for those faculty and students who were left on campus.

A festive mood reigned at volleyball and soccer games last night.

"Today took a great weight off of our shoulders," Mr. Lewis said. "We're a small enough school that everyone is still pretty tight."

Students had passed the hat among themselves and collected \$1,500 to aid the search-and-rescue effort.

"People were trying to figure out ways to help. It wasn't a gloom-and-doom situation," Mr. Lewis said.

Andrew Garcia, 18, a senior on the football team, said he learned of the successful rescue when cheering erupted on the practice field.

"We were just hoping and praying. Now all the stress is off," he said.

"For a while I was thinking it would be tough for someone [with autism]. I didn't know if he knew how to get shelter or water. I honestly didn't know if he'd be able to make it."

While the school had received no official word last night about Mr. Allen's condition or prognosis, Mr. Lewis said, "He's a tough kid. I would expect him to be back [in school] Monday."

"I'm sure he'll be surprised when everyone starts hugging him," Andrew Garcia said.

Unit 7
Subject Categories
Child (10-12)
Old Rag Mountain

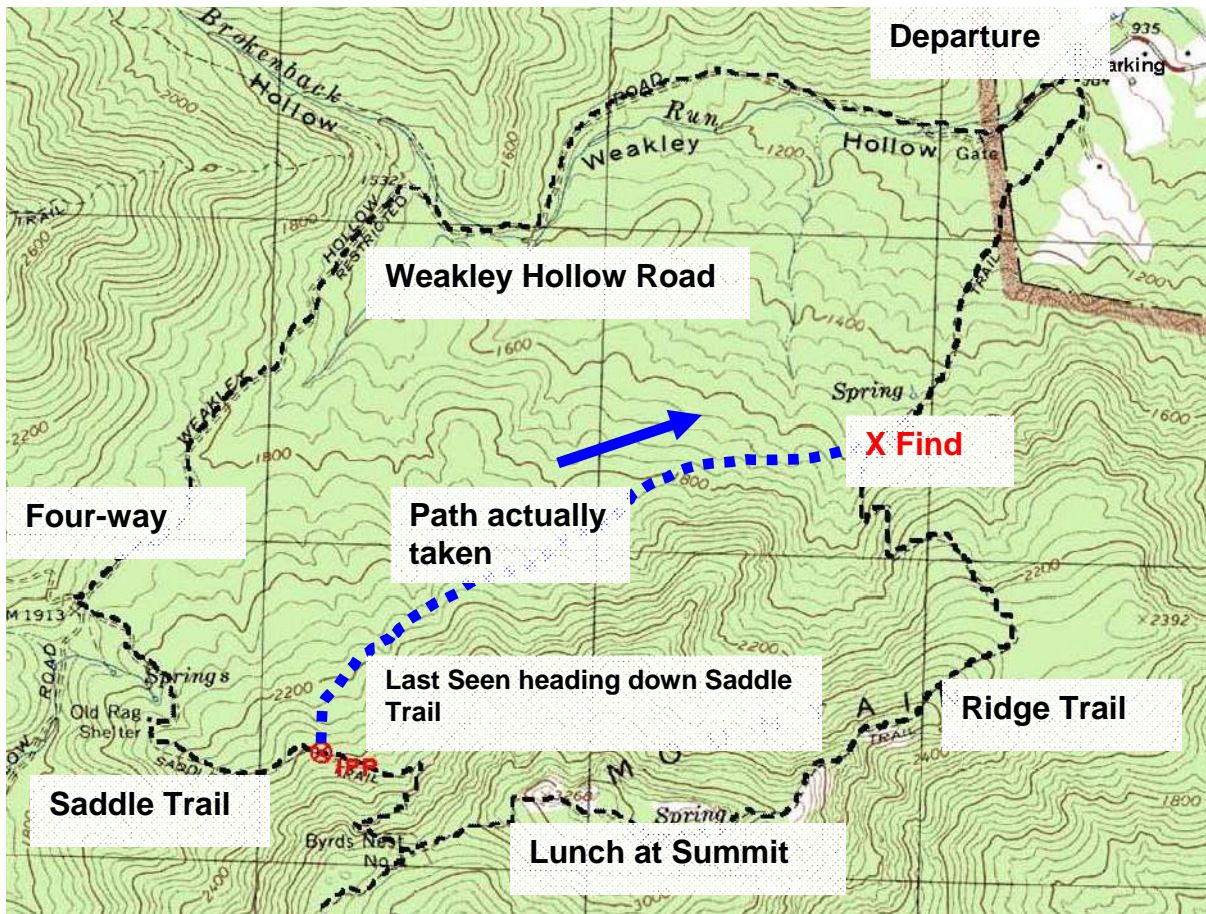
Objective: Demonstrate behavioral characteristics of child subjects.

Text Reference: Page 144-149

Instructor's Notes: The instructor should present the scenario to the class. The map problem can be run in the traditional investigation and deployment phases. The scenario does not have much investigation information that will assist students. The behavior the subject showed of transversing the entire mountain is somewhat unusual and most students will not be able to predict the behavior. However, it participants mention setting up containment, interviewing, and passing out flyers to park visitors then a find can be granted. The class may also be asked "Do you shut down the park to visitors?"

Scenario: A 10 year old male was hiking with his youth group. They parked their cars at the Weakley Hollow Parking lot located at the boundary of Shenandoah National Park and indicated by the Gate. The group hiked the Ridge Trail to the Summit (x3268) of Old Rag Mountain where they stopped and had lunch. The group then headed down the Saddle Trail. The group then became strung out with several smaller groups of youths and adults. The ten year old was last seen by an adult running ahead shortly before reaching Old Rag Shelter. They were suppose to wait at the four-way junction (Saddle trail, Weakley Hollow Road, Berry Hollow Road, and Old Rag Road.)According to some other youths in the group the subject had been talking about how much fun it would be to go off trail. It is late September with day time's highs of 65 F and nighttime lows of 40 F. The subject is wearing hiking boots, jeans, a long sleeve shirt, and a blue insulated jacket with a hood. He is not carrying any supplies.

What really happened: The subject did indeed leave the trail shortly after being last seen by the adult. During the remaining hours of daylight he slowly started to traverse to the east. He slept under a large boulder and was not spotted by the FLIR unit of the helicopter. He did report hearing the helicopter. The Incident Commander did propose the task concept of sending teams on contours to traverse the mountain. However, the staff felt these would be too difficult at night for the team leaders due to the terrain and low likelihood of making a find. The following morning the subject eventually contoured east all the way back to the ridge trail. He then made contact with a park visitor who recognized him from the briefing they received at containment set up at the parking lot. Other than being hungry, the subject was in excellent shape.



IPP: 38.5529585 N., 078.3238977 W (WGS84)

Find: 38.5616888 N., 078.3044705 W (WGS84)

Topographic Map: Old Rag Mountain, VA Note NAD27 UTM lines are hard printed on map.

Unit 7
Subject Categories
Dementia
Holly Hills

Objective: Demonstrate overall behavioral characteristics of a dementia subject. Demonstrate a single person may always follow the general patterns and still do something different each time. Demonstrate how changing the environment will change behavior.

Text Reference: Page 161-169

DVD Reference: Instructor's DVD contains six additional dementia references.

Instructor Notes: The participants should have a good understanding of dementia behavior and searching at this point. This first dementia map problem should be conducted as a class exercise since several more map problems will follow.

Students should be presented with the opportunity to either ask additional investigative questions (beyond those provided in the scenario) or deploy tasks. A find should be given when a team is deployed to the correct location.

The subject is a 78-year-old male. He previously lived in Texas but recently moved in with his son. He is not familiar with the surrounding area or the house. He retired 13 years ago from being a long-haul truck driver. No truck stops or means of public transportation are available in the rural community. He has moderate to severe dementia in the early scenarios and severe dementia after the gate has been built (he was the subject of six searches in total). He has no other medical or health issues. It is not known what door he exits from for the first three searches.

First incident: He was found next to the creek 70 meters due east from the house

Second incident: He was found 3 meters off his driveway about 170 meters away from the house

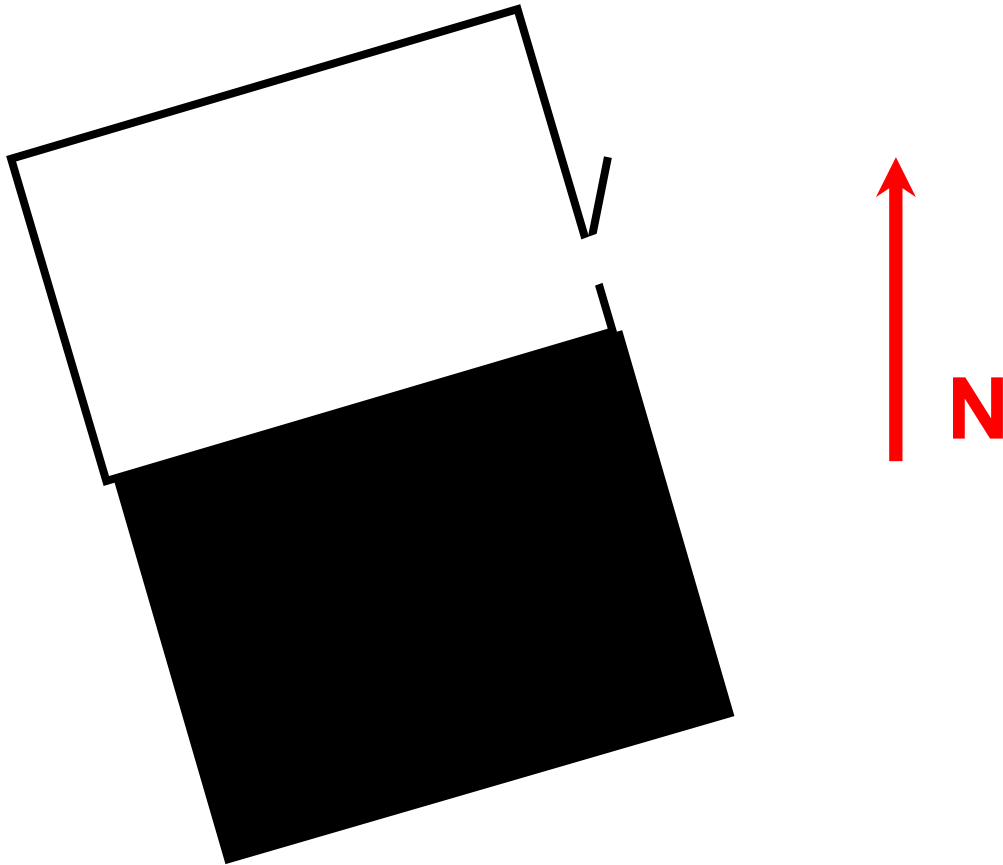
Third incident: He was found next to the creek near route 60 (750 meters). This incident represents an exception from the rule. In most cases with each repeated case the distance gets less and less. After the third incident the son built a gate in the back yard the following sketch may be used. It is important to show the relative direction of the open gate. It may be stated that although the son built the gate, he didn't get around to installing the gate.

Fourth incident: Subject found in the direction predicted by the open gate. He was found in heavy vegetation about 250-300 meters away.

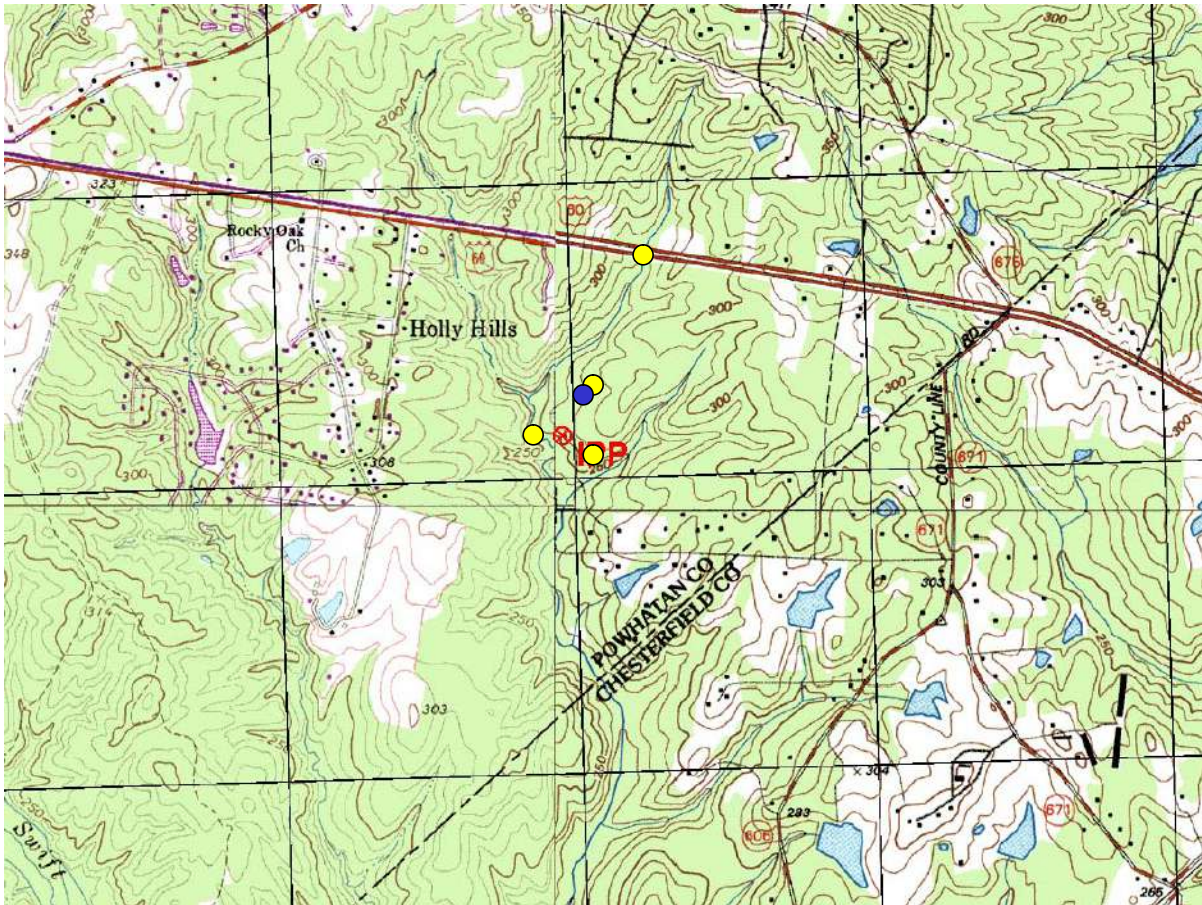
Fifth incident: The son put on the gate, but did not get around to installing the latch. Subject found in the same general location.

Sixth incident: Son installed the latch but not a lock. Subject found in the same general location. The last find location is blue. This represents the search that triggered a request for a state mutual aid response. The local law enforcement agency sent an initial search team to the correct area. However, the search took place at night and they missed the subject. At that

time they made the request for additional resources. While resources were mobilizing they search the area a second time and made the find.



Scenario: 78-year-old male with dementia was last seen at his residence by his daughter-in-law. She is reported missing at 17:00. It is now 19:00 during the fall. Temperatures are mid 70's F and he is dressed appropriately for the weather. What further information do you want and where will you deploy resources?



IPP: 37.5023500 N., 077.7494517 W (WGS84)

Topographic Map: Fine Creek Mills, Midlothian, Hallsboro, Clayville, Virginia, USA

Lessons learned: Dementia subjects often have wandered numerous times. Each incident will give insight into the expected behavior. However, even if following the overall expected behavior each incident may be very different from the last. Looking in the same location again is of course important (sometimes even multiple times). While the 300 meter rule may have found the subjects in many cases, even more focused tasks using the behavioral characteristics may result in faster finds. Prevention and getting social services such as the Alzheimer's Association or Project Lifesaver involved by also be important.

Unit 7
Subject Categories
Dementia
Brown's Cove

Objective: Demonstrate overall behavioral characteristics of dementia subjects. Secondary objective of showing behavior involved in traveling by car and use of decision points.

Text Reference: Page 161-169

Instructor's Notes: This incident should be conducted as a class. The scenario should be presented and then the participants should ask for more information and then decide where resources should be deployed. The exercise could be started from the perspective of the missing couple, or it could be started from the perspective of a car is found parked at a resident's house and he calls local law enforcement to have it removed.



On Thursday a couple departs the northern suburbs of Philadelphia to go shopping in downtown Philadelphia for a sale at Strawbridge's. He is a 84 year-old male with Alzheimer's disease and his wife is a 82 year-old female with vascular dementia. He has just recently been told that he is not supposed to drive. So, he now lets his wife do all the navigating. Somehow they miss the turn off for downtown Philadelphia and stay on I-95 (a receipt was found in the car indicating they stopped and bought gas along I-95). They most likely continued to Richmond where I-95 comes to a T-intersection, with a choice to go left around Richmond or take a right and get on I-64 towards the west. It is difficult to say where they actually exited I-64 but they eventually found themselves on Rural 810 heading North. (Instructor should switch to the next slide which shows the topographic map).



Route 810 is the yellow line in the slide which goes from South to North. They have clearly left the city and now are very much in a rural – mountainous location. The instructor should point out the sharp right hand turn that 810 takes. They missed this sharp turn and continued straight along Browns Gap Turnpike which is also a paved road.



The couple continued straight leaving 810 (at the sharp bend) and going straight onto the Brown Gap Turnpike. The actual turnpike turns off to the right (first right) and heads up the mountain. The couple continued going straight, passed a large house by the pond, entered the now gravel drive into the woods and parked in the driveway of a cabin where the road ended (yellow dot).



Closer view of the IPP. The couple had pulled in on Thursday night and parked. The car was parked in the driveway of a weekend home (able to see the green roof). The owner of the cabin arrived late Friday afternoon and found the car. He immediately called police. Running the plates found a match for the missing couple in NCIC (National Crime Information Center). The search started Friday night with scent-discriminating dogs. That only provided some limited activity around the cabin itself. At first light on Saturday the formal search started. The road the couple used to get to the cabin is indicated by the yellow lines. The white line shows a road that existed to the top of the mountain that did not appear on the topographic map. The dirt road seen to the left of that road is from logging activity that occurred after the search. It did not exist at the time. The thinner white line running horizontally is the unimproved road that can be seen on the topographic map.



Scenario: On Thursday a couple departs the northern suburbs of Philadelphia to go shopping in downtown Philadelphia for a sale at Strawbridge's. He is a 84 year-old male with Alzheimer's disease and his wife is a 82 year-old female with vascular dementia. He has just recently been told that he is not supposed to drive. So, he now lets his wife do all the navigating. Somehow they miss the turn off for downtown Philadelphia and stay on I-95 (a receipt was found in the car indicating they stopped and bought gas along I-95). They most likely continued to Richmond where I-95 comes to a T-intersection, with a choice to go left around Richmond or take a right and get on I-64 towards the west. It is difficult to say where they actually exited I-64 but they eventually found themselves on Rural 810 heading North. (Instructor should switch to the next slide which shows the topographic map).



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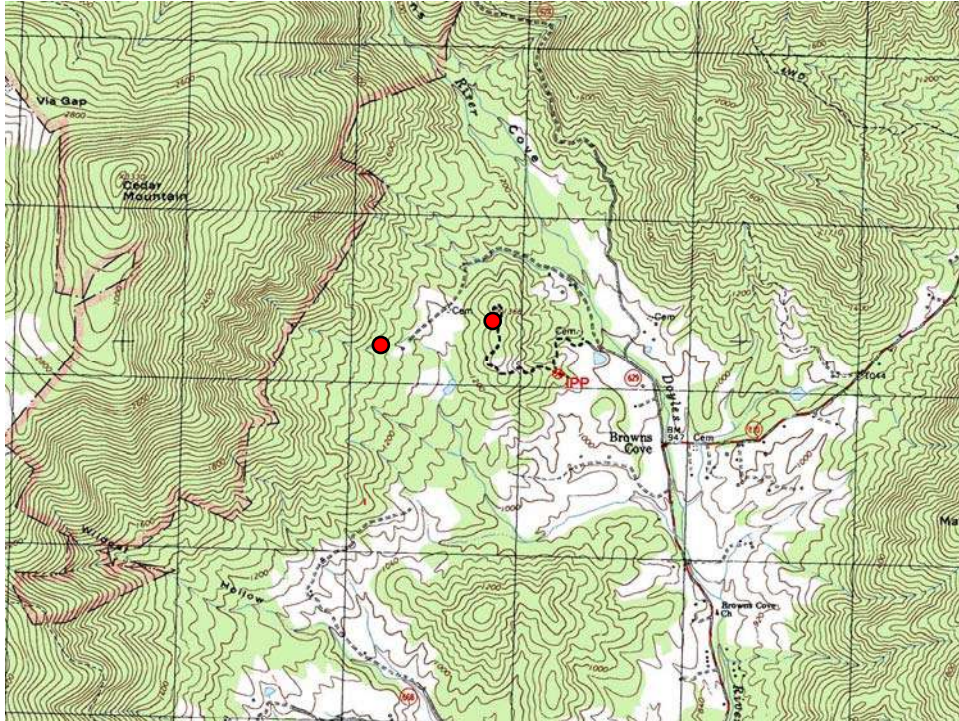
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Closer view of the IPP. The couple had pulled in on Thursday night and parked. The car was parked in the driveway of a weekend home (able to see the green roof). The owner of the cabin arrived late Friday afternoon and found the car. He immediately called police.

Running the plates found a match for the missing couple in NCIC (National Crime Information Center).

What Actually Happened:



IPP Location: 38.2066866 N., 078.6787050 W (WGS84) – NAD27 hard printed on map
Topographic map: Browns Cove, Virginia USA

The couple after spending the night in the car decided they should notify their son that they were lost on Friday morning. They did not obtain a cell phone signal so they decided they should go for help. The husband walked around the cabin and could not get in. Then as a couple they headed back up the road. However, the road they came in on actually makes a T intersection with another older farm road. They did not head back to the house but continued on straight. The wife had double knee replacements and could not walk as fast as her husband. He decided he could not wait for her and continued on. During the Saturday search effort he was found first (first click of the mouse – western most location) just off the end of the unimproved road heading up the drainage. He could not give a reliable location of where he last saw his wife, other than after leaving the car. She was found during the late afternoon by a corridor task. She was found about 30-40 meters off the road. She suffered from mild hypothermia. With temperatures heading down into the 30's (F) it is doubtful she would have survived the night. During the search 2-inches of rain fell and 150 searchers were involved.

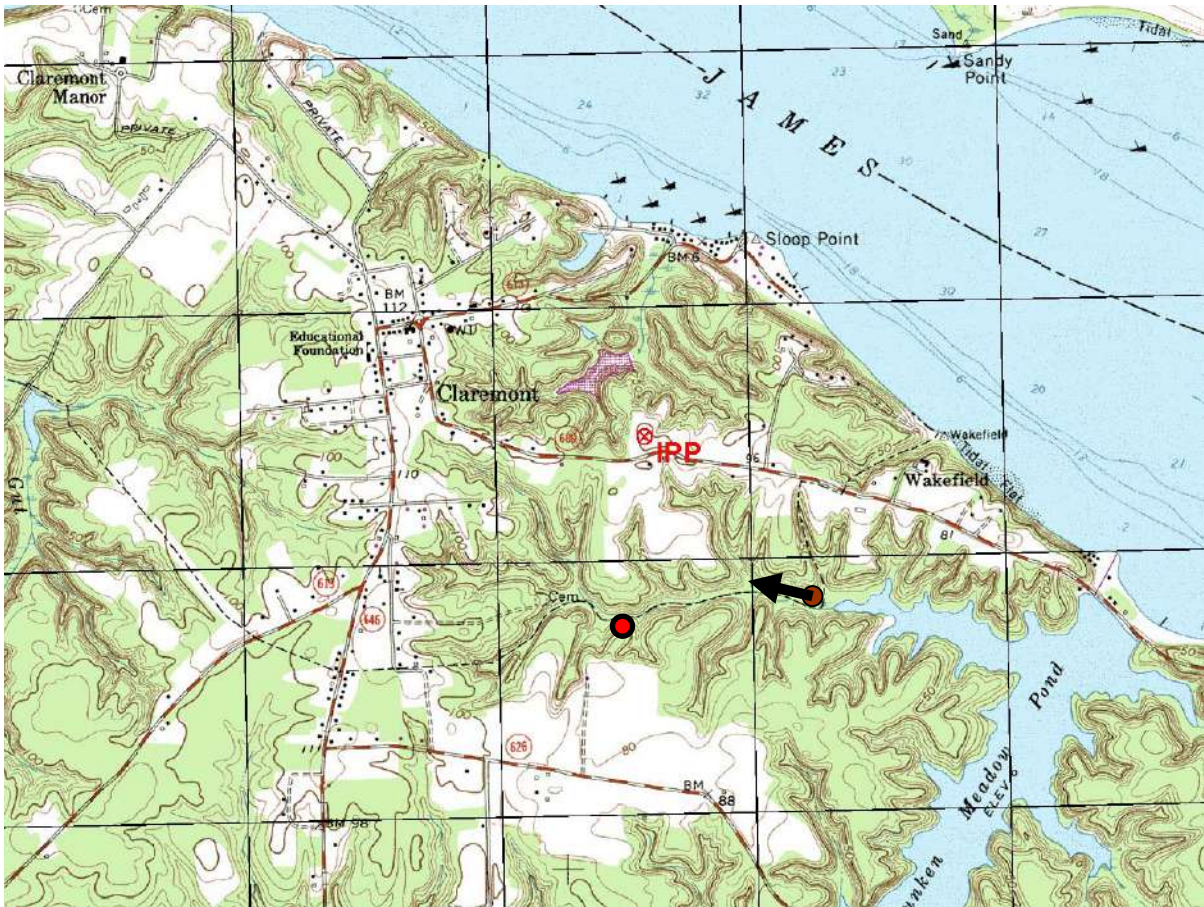
Unit 7
Subject Categories
Clairmont - Dementia
Rural

Objective: Demonstrate behavioral characteristics of dementia. Secondary purpose is the importance of the exit door.

Instructor Notes: The exercise may be conducted as a class or the map passed out for a small group or individual exercise. Since the solution should be fairly easy it makes an excellent problem for students to conduct alone.

An 81-year-old female mother with moderate Alzheimer's disease is missing. She currently lives at her son's home where she has been staying for the past six years. At around midnight the daughter-in-law thought she heard the screen door slam shut. This door faces south. When she awoke in the morning her mother-in-law was missing. She is dressed only in her pajamas and did not bring her slippers so is believed to be barefoot. She also suffers from diabetes (non-insulin dependent) and poor eyesight. The drainages into the James River are extremely steep with thick briars and heavy brush. It is a hot summer's day with highs in the upper 90's with high humidity. 60% chance of late afternoon thunderstorms. She has not wandered before.

Scenario: An 81-year-old female mother with moderate Alzheimer's disease is missing. She currently lives at her son's home. At around midnight the daughter-in-law thought she heard the screen door slam shut. When she awoke in the morning her mother-in-law was missing. The drainages into the James River are extremely steep with thick briars and heavy brush. It is a hot summer's day with highs in the upper 90's with high humidity. 60% chance of late afternoon thunderstorms.



- IPP: Residence: 37.2238191 N., 076.9545581 W (WGS84)
- Air-scent dog alert with the dog jumping straight up into the air. No fronts at the time only local winds (dog alert occurred in the morning). (Brown dot) 37.2179983 N., 076.9475615 W. (WGS84).
- Find location (Red Dot) 37.2171372 N., 076.9558884 W.

What actually happened:

Searchers were greatly hampered by the high temperatures, thick vegetation, and steep terrain. The search required three days and utilized over 200 resources including 52 active duty military. Analysis of the dog alert led to placement of a team of soldiers higher in the drainage. The information from the physic played no role. The soldiers made the find and then made a stretcher to carry-out the subject who suffered from dehydration. When she was found she was sitting against a tree playing with leaves. The newspaper article has several inaccurate items. The improvised stretcher was required because the find team was lost when they made the find and could not direct an evacuation team into them. Fire trucks with sirens were placed at key intersections to help them find a way out.

Learning Points: Subjects cross roads, reflex tasking, and careful analysis of wind currents. The front door did face south and predicted the subject's direction of travel. At the time of the search this potential factor was not known.

Topographic map: Claremont, Virginia. USA

Daily Press – Newport News, VA by Andy Parker Staff Writer, June 6, 1989

An 81-year-old Alzheimer's disease patient was found alive today after she disappeared from her trailer last weekend, the Surry County Sheriff's Department said.

Mayme McKinney was found along a road in the rural county around 11 a.m., said Freddie Clayton, a department dispatcher.

"She's in shock," Clayton said. A helicopter transported McKinney to Sentara Norfolk General Hospital for treatment, she said.

McKinney, who suffers from Alzheimer's disease, diabetes and extremely poor eyesight, was last seen at about 10:30 p.m. Saturday. She was in her bedroom in the mobile home she shares with her son, John Summerville, and his wife on Route 609 in the eastern edge of this small riverfront town in Surry County.

Rescue workers from as far away as Maryland and North Carolina representing more than 20 emergency organizations searched through the night Sunday and all day Monday. Late Monday afternoon, 57 Army troops from Fort Lee near Petersburg joined the search.

The search was limited to a 2-square-mile area bordered on the north by the James River and the south by Sunken Meadow Pond. The terrain around the mobile home consists of thick forests and deep ravines, many of which include sudden dropoffs of 30 to 40 feet, said Surry Sheriff W.C. Andrews.

After volunteers and search dogs were unable to find McKinney early Sunday, the family sought the help of a psychic Sunday afternoon. The psychic, who was not identified, said McKinney would be found hiding in a dark place, possibly near a pile of logs, somewhere not far from the mobile home, according to reports verified by Andrews. The psychic also said McKinney was afraid of the searchers and would attempt to evade them.

Late Sunday afternoon the area around the mobile home was cleared of all rescue workers for about an hour in hopes that McKinney would return to the mobile home.

Several local boat owners searched the shoreline of the river and at least one private airplane and a State Police helicopter joined the search Sunday.

A group of about 15 searchers combed the woods around the trailer through the night Sunday, said Robert J. Koester of Appalachian Search and Rescue, who was coordinating the search.

The search was called off about 8:30 p.m. Monday after a thunderstorm and high winds passed through the Claremont area, said a Surry Sheriff's Department dispatcher.

The search resumed this morning.

Unit 7
Subject Categories
Dementia
Charlottesville – Urban

Objective: Demonstrate overall behavioral characteristics of dementia subjects in an urban context. Secondary objective of showing importance of good investigation and urban search techniques.

Instructor's Notes: This map problem is somewhat of a trick problem in that it represents two separate searches (from the same IPP) melded into one scenario. Therefore, it is best presented as a class presentation. The IPP remains the same, the investigative information remains the same, and the only difference is the two outcomes. One requires field deployment and the second depends upon investigation. After the class locates the first subject the problem continues until they locate the second subject.

An 83-year-old female has recently been placed into a nursing home. She has moderate dementia and was placed into the home since wandering (in her home) has recently started to become problematic. She was last seen by a staff member doing checks at 23:00. She was noticed to be missing at the morning check at 05:00. The facility has four exit doors, no video or alarms and it is unknown which door she may have exited from. She has been recently placed and has been at the facility for only a week. She grew up in the Belmont neighborhood (locate on the map if student's ask) and has lived there her adult life. She was a homemaker. She has no other health problems other than dementia.

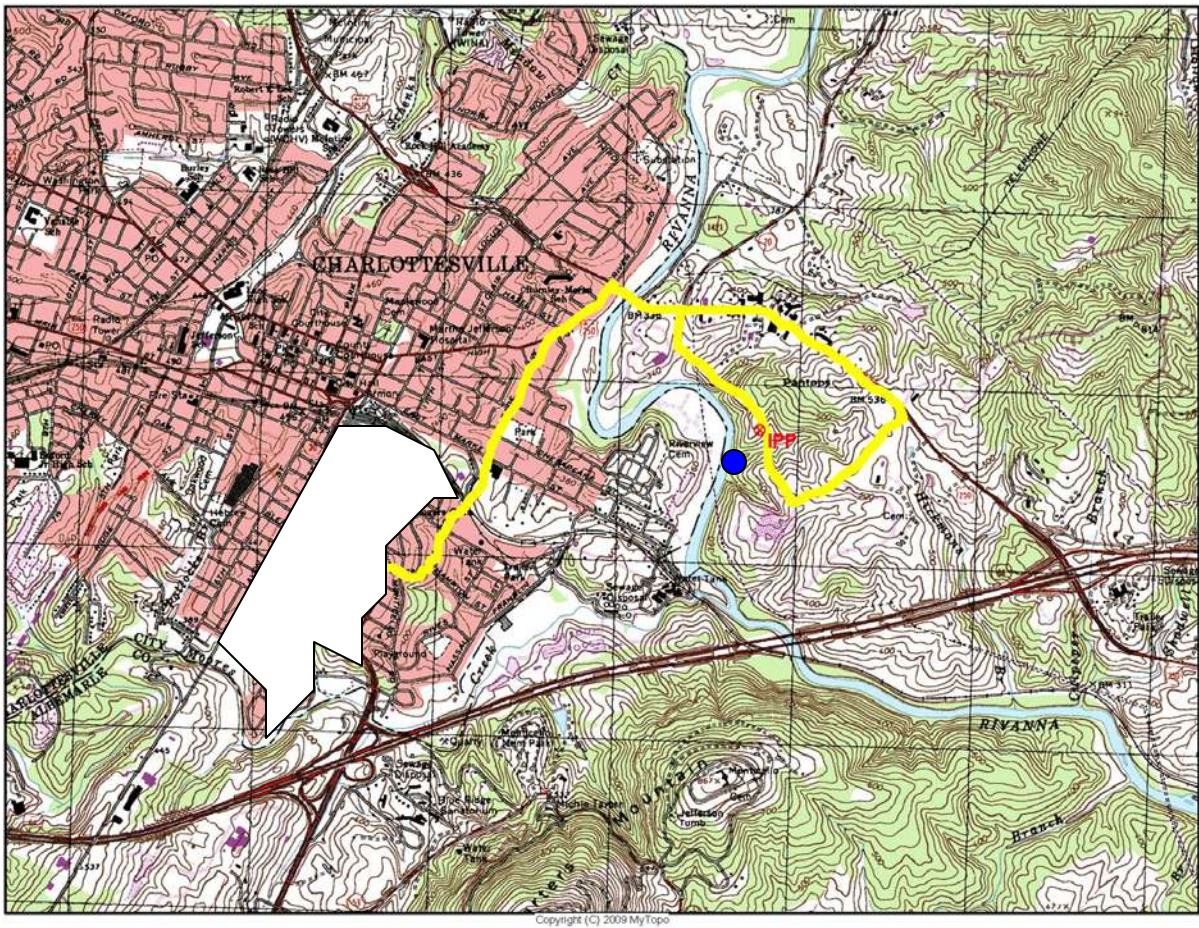
The nursing home itself is not on the topographic map. This is an opportunity for the instructor to point out one of the common problems of urban searches. The actual building can be seen in the aerial photography. The first PowerPoint slide shows the general area and gives the scenario. The second slide zooms in a little closer. This slide should be used for the general scenario when the participants are asking questions. The third slide zooms in closer and also shows the aerial photography which also shows the actual IPP. The large structure is a State Farm insurance company which is gated and secured. Video tape is available which shows no sign of the subject. The low head dam in the river is also visible in the photography.

Scenario: An 83-year-old female with moderate dementia was last seen in bed at her nursing home at 23:00. When checked upon at 05:00 she was no longer present. It is unknown how or where she exited the facility. It is summer with clear weather.

What Really Happened: Both searches resulted in a formal search effort. In the first case the subject left the nursing home and most likely walked to Richmond Road (250) and then traveled west crossing over the Rivanna River via the Bridge. The street the nursing home was located on was recently built and it is expected that she would not have been familiar with that road. However, Richmond Road would look familiar to her. It is not unexpected for her to then take High Street and then Meade Ave back to her old neighborhood in Belmont. The route itself would be 3.8 miles long (6.1 kilometers) with the distance from

the IPP being 1.6 miles (2.5 kilometers). She was found standing at the intersection of Bolling Ave and Meridian Street. The street names are not found on the topographic map but are found on Google Earth and other mapping systems. A police officer had noticed she seemed confused and out of place. He was able to put together the “Be On the Lookout” (BOLO) that had been issued by the county. It is worth pointing out to the participants that the City and County are different police forces and the dividing line is the river. In this case the City and County share a joint dispatch center which helped tie the two cases together.

The find should be given to the students when they list techniques that are more investigative in nature. This would include issue a BOLO, put out a Silver Alert, use reverse 911, notify local jurisdictions, put out a press release, etc.



The yellow line indicates the possible path of the subject who was found in her old Belmont neighborhood. It is unknown if she headed north or south out of the nursing home. The Belmont neighborhood is indicated by the white shading. The blue dot indicates the corner she was found at.

The other blue dot indicates the drainage the second subject was located in. She was found quickly by a search team in good condition.

Clues and Find:

IPP: 38.0278205 N., 078.4502548 W WGS84 (note NAD27 Gridlines printed on map)

Belmont Find: 38.0229145 N., 078.4783082 W WGS84

Drainage Find: 38.0265171 N., 078.4512089 W WGS84

Topographic Map: Charlottesville East, Virginia, USA

Learning Points: Nursing homes need education and preplanning to mitigate against wandering incidents. Several programs exist to help develop a preplan for a nursing home or caregiver. Belmont incidents highlights the need for good investigation and the need to identify former living locations. The urban nature of the search shows need for better maps, changes in maps, need for good investigation, making the public aware, notifying all first responders, need to conduct an active search – even is search area is small.

Unit 7
Subject Categories
Despondent
Ruckersville – Rural

Objective: Demonstrate overall behavioral characteristics of despondent subjects in a rural context. Demonstrate using an actual search how determining the correct location to look may not always lead to a find.

Instructor Notes: A 44-year-old female was last seen by her children at 09:00 in the morning when they left for school. She has a history of depression and sleep problems. The depression and sleep problems have gotten worse over the last two weeks. She normally did not prepare breakfast for the children but this morning she did. The children reported she was more affectionate than normal. When they returned home, she was not present. Her husband is out of town on a business trip, this was confirmed as a legitimate business trip. No suicide note was left. However, the previous day she called two of her close friends and expressed her appreciation for their friendship.

The children reported that she was wearing beige fleece jacket, black running pants, black sneakers, and a black sweat band.

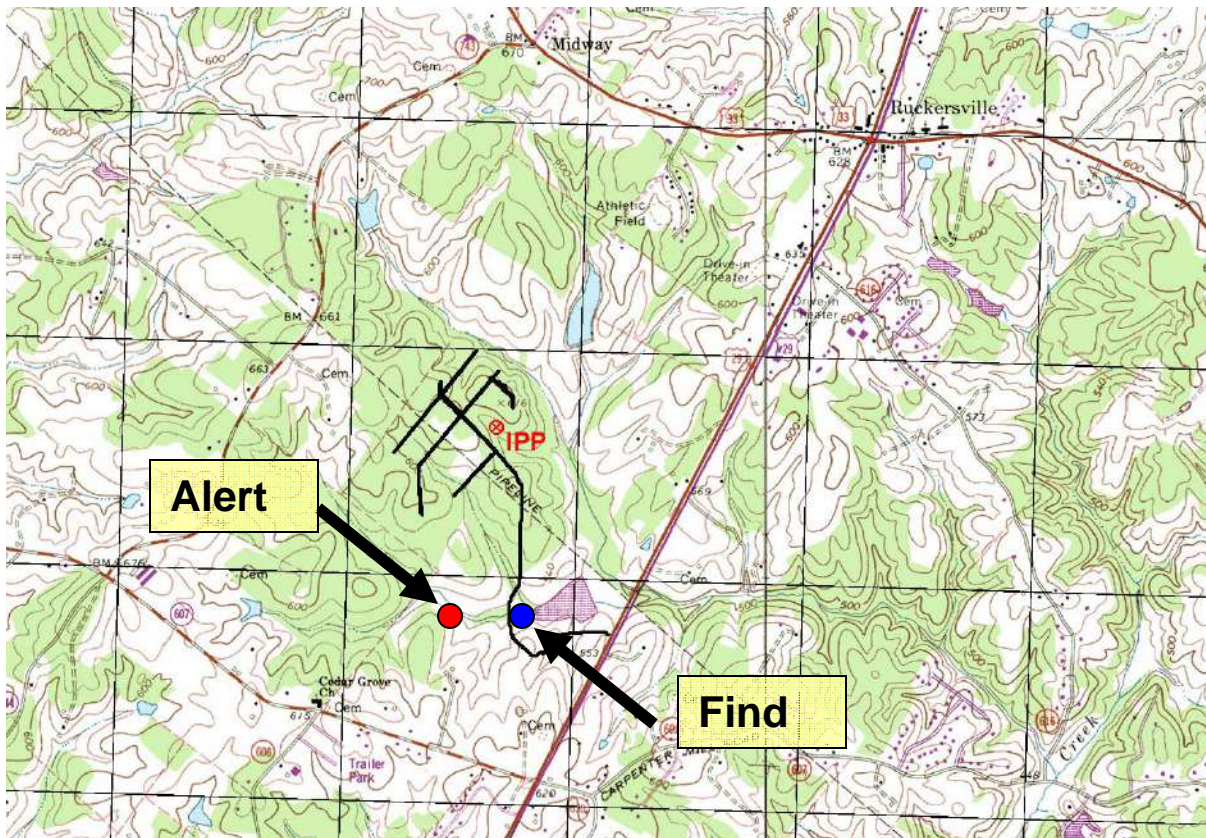
Missing from the house is a picture of the family and the husband's handgun. She has her own handgun and from time to time shoots on a range. The missing handgun fires a .357 Magnum ammunition.

While she had been car camping with the family she did not particularly like the woods or bugs. The family was originally from New York and they ran a popular New York Pizzeria in town. During the day she was often seen walking along the roads in the subdivision. No marital or financial difficulties. Investigation shows no activity on cell phone or credit cards.

She was located by a search team within the search area deceased from a gunshot wound to the head.

Option: An optional slide is included that shows some of the details from the actual search. While defining the high probability area should be fairly straight-forward (the ponds) it is important to realize that success depends upon both defining the area and detecting the subject. This course does not address detection but it is a critical component of formal search theory. Just putting a team in the right place is not enough. In this case the subject was dressed in black and beige colors that would blend in well with the dry foliage. In this rather unusual case it took eleven teams task out of the total 103 tasks to finally locate the subject. In fact the find team made the find at night. Previous teams included helicopters, air-scent dogs, Bloodhounds (not included in the total), and sweep teams. Probability of Detection values were those given by the teams and not calculated by any search theory formula. The cumulative POD values are given to the right.

Scenario: A 44-year-old female who suffers from depression and sleep problems is last seen at her residence by her children when they left for school. Upon returning home from school she was not present. It is March with a daytime high of 57F and a low of 35F.



Clues: A total of 16 clues were reported. Only one had any possible relevance to the find, which was a strong alert with the wind coming from the pond. Four air-scent dog alerts (one possibly valid listed), three sightings, three involving footprints, and six physical items located.

IPP: 38.2217341 N., 078.3884406 W (WGS84)

AS Dog Alert: 38.2143511 N., 078.3896592 W (WGS84)

Find: 38.2147652 N., 078.3866120 W. (WGS84)

What Actually Happened: Investigation early on pointed to depression and a strong chance of a suicide. It also helped to rule out other scenarios. The search started soon after she was reported missing since this was out of character for her. The responsible agent made sure every search team dispatched had an armed law enforcement officer. This required considerable mutual aid since the county itself has a relatively small law enforcement department. The search resulted in 32 search tasks being sent out the first day and night. On the second day 71 search tasks were dispatched. The actual search area was defined by four major roads. It was felt she would not want to be seen carrying a picture and firearm and would not want to cross a major road. It was known she was not an outdoor type of person

so the scenario of being just a short distance off a road made the most sense. The desire for a scenic location and a sense of privacy would be important.

Her actual find location by the pond meet all of the above criteria. While she did penetrate some thick brush for a couple of meters that was required to be out of sight. Her clothing; beige and black blended perfectly with the local terrain and she was difficult to detect. The searcher who ultimately made the find (at night) just about stepped on her before making the detection. The size of the search area assigned to the find team was eight acres with five people assigned to the task.

Learning Points: Good early investigation kept the search focused on field issues. The search had a well-defined search area. Sending out law enforcement with SAR teams in the end was not needed, but was an excellent call. A more objective method of reporting POD than self reporting is needed but difficult to implement. A field trial of even a estimated sweep width would have most likely helped. Statistics tell you that it is not likely to find someone in an area that has a PODcum of 99.8%, but it is still possible or expected to occur 1 out of every 500 searches.

Unit 7
Subject Categories
Despondent
Chris Greene Lake – Park

Objective: Demonstrate overall behavioral characteristics of despondent subjects.

Instructor Notes: A 45-year-old research professor in neurobiology employed by the local university was last seen leaving work early (before lunch). When his wife comes home she finds his wallet (except for driver's license) on the kitchen table along with a short note that only gives the PIN number to his ATM account. She reports him missing. Late that night when the local park closes a car is still in the parking lot. The plates are run and it is determined to be his car.

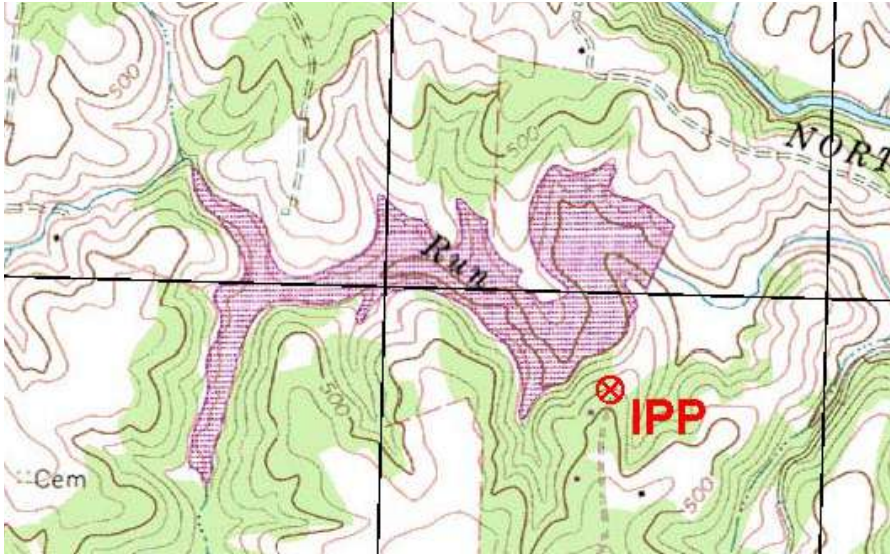
This was the day he was expected to hear if his grant was going to be funded. If the grant was funded he was going to be offered a tenure track position. If the grant was not funded he was going to need to find a new job at a different university. His grant was not funded.

His wife also holds a research position. Much of their lives revolve around research interests. She is happy with her position and likes the area. They have two children. They all have visited Chris Green Lake Park once before to go swimming. He did not hike any of the trails. His car is located in the first parking lot that has access to a trail. The trail is not located on the map and will need to be shown to the participants.

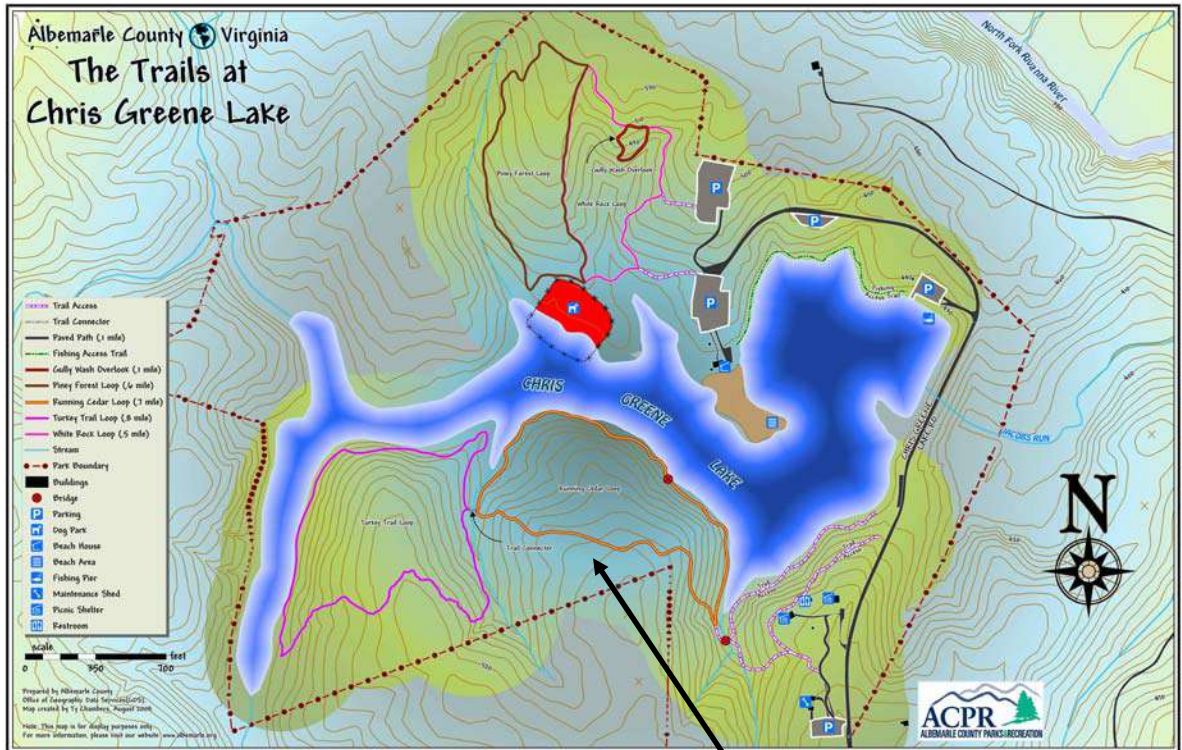
He did not suffer from depression but was known to be impulsive. He had been apprehensive about the grant. He had no other medical conditions. He did not own or have access to a firearm. Nothing of interest was found in the car.

Anyone familiar with typical neuroscience labs will know they often contain a wide array of highly toxic poisons used in research. These substances are not under any strict controls so determining what might be missing from a lab would be difficult. During the actual search this was pointed out to local law enforcement and the question was asked if they needed to bring in a state hazardous material team. Since all of the common neurotoxins found in a typical lab must be ingested they pose little harm if a responder wears gloves and does not taste any white powders.

Scenario: A 45-year-old research professor in neurobiology employed by the local university was last seen leaving work early (before lunch). When his wife comes home she finds his wallet (except for driver's license) on the kitchen table along with a short note that only gives the PIN number to his ATM account. She reports him missing. Late that night when the local park closes a car is still in the parking lot. The plates are run and it is determined to be his car. This is the IPP.



Topographic map does show the lake and the road into the lake, but does not include most of the changes that occurred one the lake was turned into a park. Key missing components is a map showing the trail system. A local park map is available and a PowerPoint slide exists that also shows the park’s network of trails.



IPP: 38.158960 N., 078.438149 W. (WGS84)
Find: 38.160786 N., 078.442004 W. (WGS84)

FIND

What Actually Happened: The subject parked his car and then using signs found access to the trail network. He headed west along the Running Cedar Loop taking the more southern loop. He left the trail and headed uphill and then using a bottle of cyanide took a fatal dose.

Once his car was located late at night, some additional investigation was conducted and a search was requested that night. Resources arrived at 04:30 and the search started at 05:00. The first team dispatched, an air-scent dog team) was sent to work the trails. The dog alerted at the bottom of a small ravine, the team headed uphill and the walked spotted the subject deceased. The find was made at 05:30.

Learning Points: While in this case the subject did put the lid back on the bottle of cyanide it is important to keep a close eye on canines. The incident demonstrates how it always important to attempt to determine the method of potential suicide and the safety impact it may have on searchers.

Unit 7
Subject Categories
Despondent
Castle Hill – Rural

Objective: Demonstrate overall behavioral characteristics of despondent subjects.

Instructor's Notes: A 69-year-old farm manager is reported missing by his wife. He was last seen leaving the house (which is located on the farm property) after lunch. He did not return for dinner. After some quick searching on the part of friends he was reported missing.

He has a history of depression. The previous night he called his psychiatrist to schedule an appointment. The psychiatrist was not able to meet and called in a prescription for the subject. The subject never picked up the prescription. It is typical for him to get depressed on the anniversary of his brothers death (by suicide) which is today.

He has been the farm manager for the Castle Hill property for 30 years and is well liked by the property owners, other farm workers, and everyone in the surround community. He has always done an excellent job and is considered somewhat of a perfectionist. He knows the property extremely well and it is considered impossible for him to become lost on the property. He does hunt and the wife cannot locate his hunting rifle.

All other investigation points towards him being in the field.

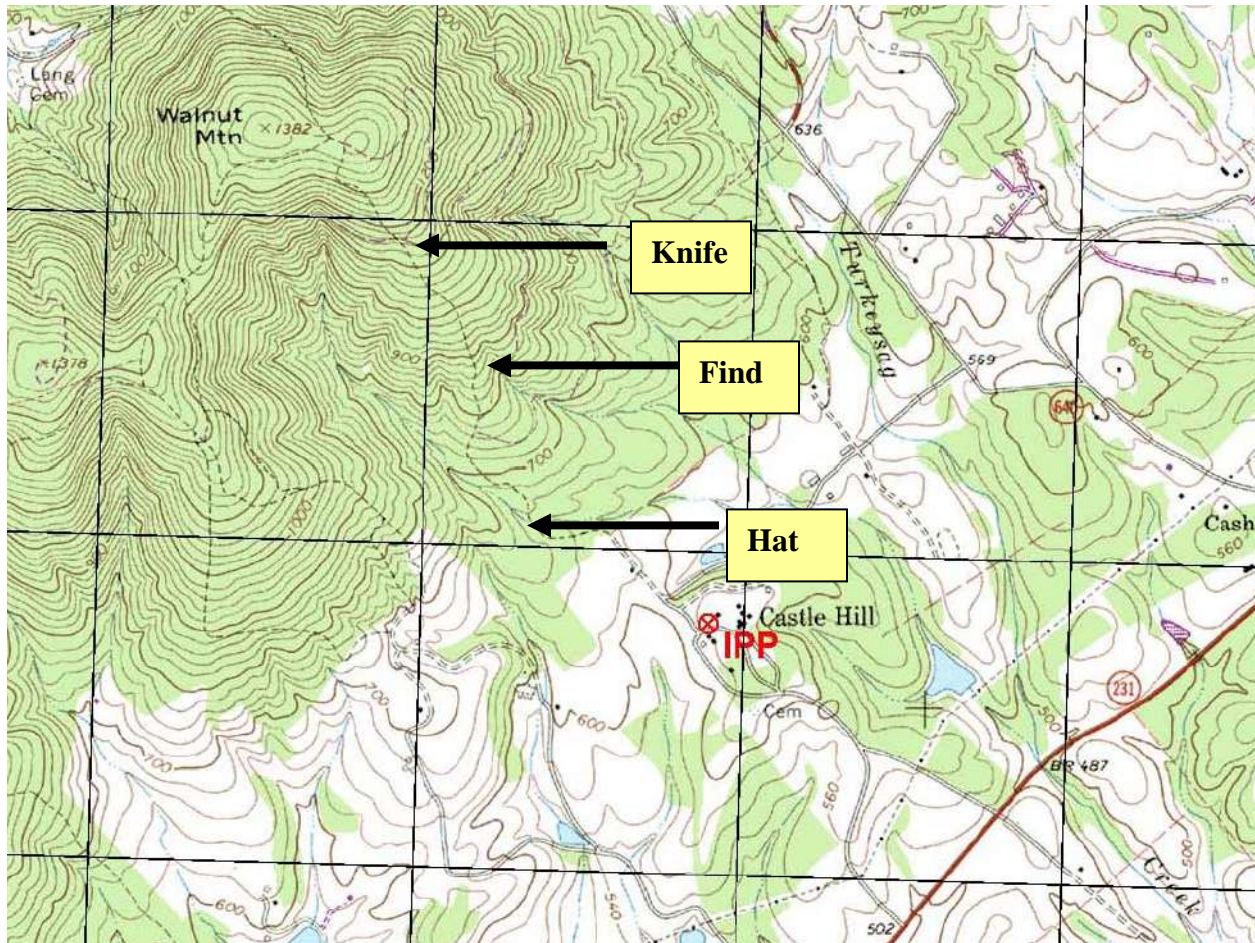
The first slide shows the overview of the search area and matches the printed map. The second view shows an aerial view. The third slide is enlarged and should be used for running the map problem.

The actual search produced two significant clues. The first was his hat and the second was a knife. These are marked on the scenario map.

Scenario: A 69-year-old farm manager is reported missing by his wife. He was last seen leaving the house (which is located on the farm property) after lunch. He did not return for dinner. After some quick searching on the part of friends he was reported missing. It is now 21:00 and night.

What Actually Happened: The history of depression was quickly uncovered by law enforcement as part of the initial investigation. The area around the residence and the trail up to the summit of Walnut Mtn become high priority tasks. All searching and finds occurred at night during a heavy rainstorm. An ATV task located the subject's hat first. This was followed up with a sweep team continuing up the trail. This team located the knife. The knife was identified has coming from the subject's kitchen. Additional resources were dispatched to head up the trail. The subject was located between the knife and the hat about four meters off to the side of the trail. It appears that after slicing both his wrists (deeply) he decided to head back down the trail. Unfortunately, most likely due to the severe loss of blood he tripped over a log and suffered an

open fracture of his lower leg (tibia). He was found deceased. His rifle was later located in his house.



IPP: 38.0854914 N., 078.2989708 W (WGS84)

Hat: 38.0887308 N., 078.3051373 W

Knife: 38.0964500 N., 078.3098282 W

Find: 38.0930384 N., 078.3068312 W

Topographic Map: Keswick, Virginia, USA

Unit 7
Subject Categories
Despondent
Whiteoak Canyon - Wilderness

Objective: Demonstrate overall behavioral characteristics of despondent subjects in a wilderness context.

Instructor's Notes: From a lost person behavior perspective this scenario matches the profile quite well. The distance traveled is beyond the just out of sight behavior but it matches everything that is expected. The scenario does show that good investigation is key to developing the correct subject category. From a student perspective since it is presented in the despondent section it is clear. However, the instructor may wish to pull a few scenarios and present them at the end, so students need to collect additional information to determine the correct scenario. While this case may have started out as a possible missing hiking it quickly was run as a despondent since relevant investigation uncovered key factors.

For instructors comfortable with discussing investigation and investigation techniques, this search is an excellent opportunity to present the use of timelines. Otherwise, keeping track of dates can be difficult since they did not unfold in a linear fashion.

On September 6 Hurricane Fran struck central Virginia with 75 mph winds and 13 inches of rain. This caused significant destruction to trees at higher elevations, especially in Shenandoah National Park. A road cutting crew was able to reach the Whiteoak Canyon trailhead parking lot on September 7th. They found a red Hyundai with a notice to evacuate that was left prior to the storm on September 5th. Unfortunately, when they ran the plates and contacted the rental company on the 5th the rental company provided the wrong information regarding the renter. However, on the 7th they learned the car had been rented by a 27-year-old male who had been reported missing on September the 3rd. In the car was new camping equipment, two boxes of ammunition, a box for a 9mm handgun, a sales receipt for all the gear dated August 30th. The handgun could not be located. A review of credit card charges showed the last activity was August 30 at the Big Meadows lodge for a dinner and paying for a room at Skyland the night of the 30th. A review of the park's videotape at the entrance stations showed his car entering on the 30th. Therefore, it was possible to talk to the entrance station ranger on duty at that time. The ranger was able to recall the subject and him asking where the best waterfalls were in the park. The ranger directed him to the Whiteoak Canyon trail. He was not familiar with the park.

The family reported he had received a set back to his career in the State Department but he was looking forward to his first assignment as a Foreign Service officer to Athens. He had mentioned doing some hiking and camping to help relax. Additional investigation with the State Department revealed that he had just failed a second polygraph test regarding mishandling of classified material while a naval officer in Athens. He had failed the first polygraph test when applying to work for the CIA in 1995. The CIA notified the FBI, but the FBI had only notified the State Department a month prior to his scheduled deployment to Greece. Upon learning this

the State Department administered a second polygraph test which he failed. He then lost access to all classified material and restricted areas.

The search started on September the 7th. The combination of previous significant rains, the 13 inches from Hurricane Fran, and the high winds caused many of the hardwood trees to be toppled over with full foliage. This created an almost impenetrable tangle of fallen trees on the roads and trails throughout the park. Most of the park was closed and access to buildings was limited. Electricity was provided by generators. Students when deploying resources will most likely want to deploy a team down into Whiteoak canyon. This will be difficult.

Scenario: A rental car located at trailhead to Whiteoak Canyon trail (Sep 7th). On Sep 6th Hurricane Fran passed through the park dumping 16 inches at the nearby Big Meadows weather station. Winds were recorded at 75 mph causing many trees to topple. The car was rented by a 27 year-old male who was reported missing on Sep 3rd.

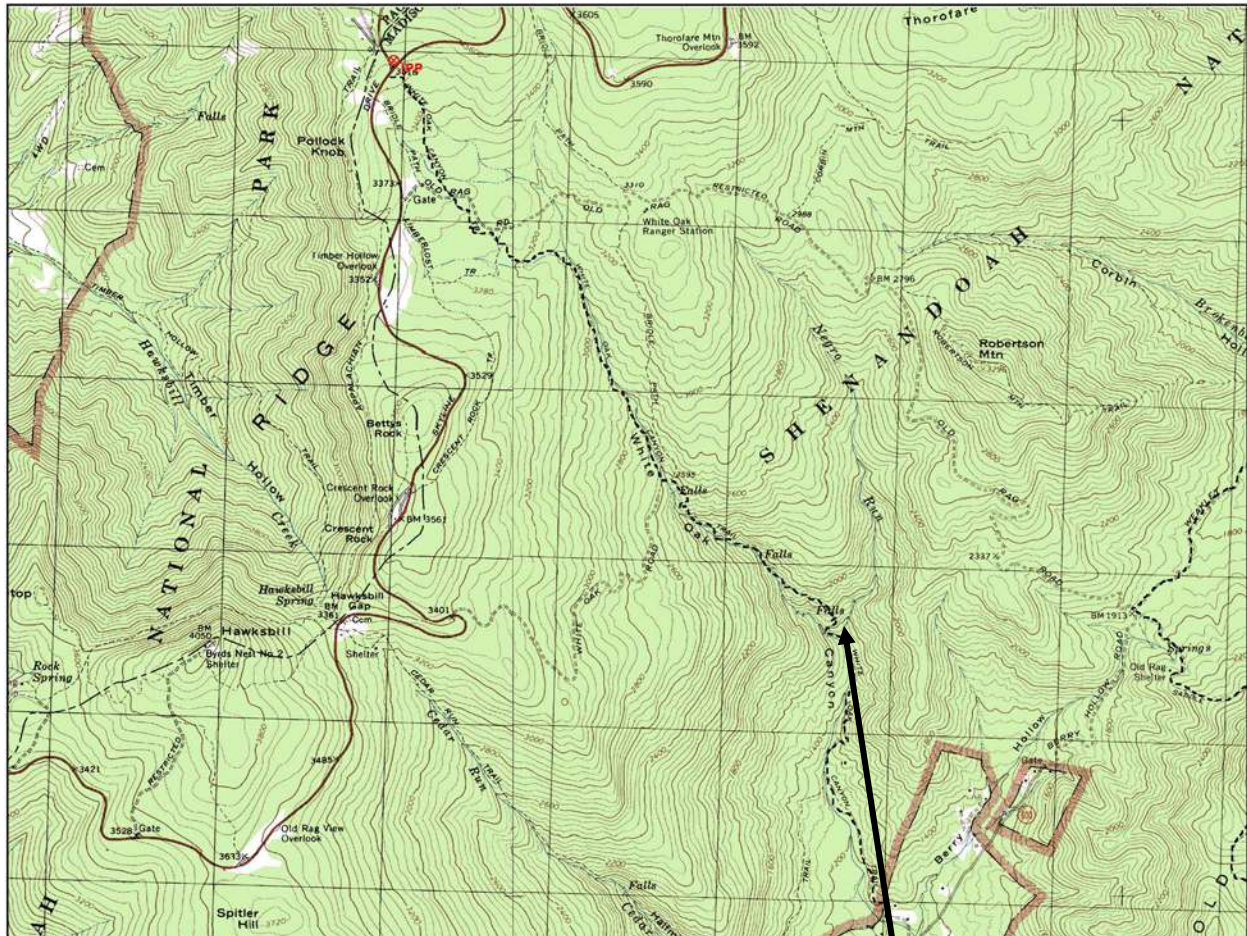
What Actually Happened: The information from the family pointed more to a lost hiker scenario. However, the purchase of the gun quickly pointed the search towards the despondent scenario. Since a federal law enforcement agency was conducting the search and investigation, the State Department was forthcoming with information. Key facts and factors were known to search planners early in the search.

While search strategy using lost person behavior profiles was straight forward, carrying out the strategy due to the Hurricane was highly problematic. The need to search down Whiteoak Canyon was clear along with special emphasis around the waterfalls. During the actual search the first team simply gave up after spending hours to travel about a half mile (one kilometer). The second team was an air-scent dog team and the handler broke her leg. After that no further teams were dispatch until a maintenance crew spent two days with chainsaws to clear the trail. Access from the bottom of the trail also failed. Once the trail was cleared teams could move down the trail. No air-scent dog alerts occurred. Teams were dispatched to search around each of the waterfalls but after hours in the area they reported PODs of 5-10%. A Blackhawk helicopter was also used to fly at tree top level. The search was active from September 7th-15th and then suspended.

On October 28th a park visitor stepping off the trail to relieve himself spotted yellow highlighters that belonged to the subject and then spotted the deceased subject. He was 40 yards off the trail in a rocky location. By this time the leaves had started to drop off the fallen trees and visibility was increasing.

Timeline

- 1993 – 1995 Surface Missile Officer on USS Chancellorsville
- 1995 Applies for job with CIA fails polygraph test
- 1995 CIA informs FBI of test results
- 1995 Subject hired by State Department as Foreign Service Officer
- Aug 1996 FBI informs State Department
- Aug State Department give second polygraph test – fails
- Aug State Department suspends deployment, restricts access
- Aug 30 – Rents car, leaves Arlington, purchases camping gear, ammunition, and gun on way to Shenandoah National Park.
- Aug 30 – Uses credit card to buy a dinner at Big Meadows Lodge
- Aug 30 – Rents a room at Skyland
- Aug 31? – Parks car at trailhead to White oak Canyon Trail.
- Aug 3rd – Reported missing in Arlington, VA
- Aug 5th – Rangers leave note on car in preparation for Hurricane Fran. Run plates but car rental company gives wrong information.
- Aug 6th – Hurricane Fran hits park with 13 inches of rain and 75 mph winds. Many trees toppled and uprooted.
- Aug 7th – Car found at trailhead again. Plates run again and matched to subject
- Aug 7th – 16th – Active search for subject. Suspended on 16th.
- Oct 28th – Subject located by park visitor 40 yards off trail.



FIND

IPP: 38.5861019 N., 078.3830157 W (WGS84)

Find: 38.5561534 N., 078.3525686 W (WGS84) 40 yards off trail, by falls.

Learning Points: In some cases it may be required to suspend a search even when you have a good idea where the subject might be located. Follow-up is always important. Good investigation can change the subject category.

Arlington Man Sought In Park Has Been Missing Since Sept. 3

Date: September 16, 1996

By DAN McCAULEY News-Record Staff Writer An Arlington man reported as missing in Shenandoah National Park since last Thursday was initially reported as a missing person to Arlington County Police eight days ago, and was reportedly in the national park at the end of August. James S. Schneider, 27, was reported as missing person to Arlington police Sept. 3, police department spokesman Tom Bell said Wednesday.

National park officials issued a statement Wednesday night indicating Schneider apparently was in the park Aug. 30 and spent the night in Big Meadows Lodge.

Family members said Schneider wanted to see Shenandoah National Park before taking a post with the Foreign Service in Athens, Greece. But investigators also learned he was "upset about personal matters" before visiting the park, the park statement said.

Bell did not say who reported the man as missing or give any other information about Schneider.

"That's under investigation by another agency. Whenever another agency is involved, we don't comment," said Bell, referring calls to the National Park Service.

Park officials said Schneider left new camping gear that was unopened in the back of his car found in the parking lot of Whiteoak parking lot -- the access point to what the park brochure boasts as a five-mile-long trail with six waterfalls along the way. Nearly two dozen people searched the park Wednesday for Schneider, but a planned helicopter search was called off due to fog and other weather problems, said Lyn Rothgeb, park spokeswoman.

Schneider is described as a white male with brown hair, green eyes; 5-feet, 11-inches tall and 190 pounds.

The parking lot where Schneider's car was found is near Skyland Lodge area where two women hiking the Appalachian Trail in May were killed when their throats were cut.

Julianne Williams, 24, of St. Cloud, Minn., and Lollie Winans, 26, of Unity, Maine, had been hiking and camping in the park's backcountry. Park officials found the bodies after Williams' father reported that she was overdue from the trip.

Julianne Williams' parents, Tom and Patsy Williams, said this summer they planned to spend the time around their daughter's birthday this month in the park visiting the site where their daughter and her companion were found slain.

The parents had planned to be in the park this week, but due to Hurricane Fran, the subsequent flooding and the resulting closure of the park for cleanup, the trip has been put off until next week, according to a statement issued by the Williams family.

Park officials were not available for comment on Schneider's case or that of the two women.

Officially, Schneider is considered someone missing in Friday's storm. But Schneider's car was located Thursday by park rangers who scoured the park trying to clear people from the park as the remnants of Hurricane Fran neared the area. Rangers could not find him, but left a note on the windshield of his car. Rothgeb said Monday that rangers spotted the car in the parking lot with the note still on it Friday.

The Washington Post

by Charles W. Hall; Louie Estrada Sep 21, 1996

A Foreign Service officer who vanished in Shenandoah National Park last month may have compromised Navy missile secrets while serving as a lieutenant in the Persian Gulf, according to federal investigators who said they are trying to find him for questioning.

James S. Schneider, 27, was last seen Aug. 30 at a restaurant in the park, just days after his expected assignment to Greece was suspended because he failed two polygraph tests, law enforcement officials said. The sections he failed focused on whether he had mishandled classified information or been contacted by foreign agents while he was aboard the USS Chancellorsville, the officials said.

Adding to the mystery are questions about whether Schneider is still alive. Park rangers found Schneider's rented red Hyundai sedan in a parking lot 10 miles from Big Meadows Lodge, where he was last seen. In it, investigators found newly purchased camping equipment, two boxes of ammunition and a sales slip for a recently purchased handgun, but no gun, park and other federal officials said.

Feds Reportedly Knew Man Missing In SNP Was An Intelligence Risk September 30, 1996

Staff and Wire Reports Federal investigators knew for months that the Foreign Service officer still listed as missing somewhere in Shenandoah National Park may have divulged missile secrets, according to media reports. James S. Schneider, 27, Arlington, has been missing since Aug. 30, when he was seen at the Big Meadows lodge and near Skyland along the park's Skyline Drive.

CIA officials took three months to report to the FBI that Schneider failed a polygraph test and the FBI then took more than a year to inform the State Department, according to reports in The Washington Post. Schneider served as a surface warfare officer on a guided-missile cruiser, the USS Chancellorsville, for three years. In April 1995, Schneider sought a job at the CIA, the newspaper reported. During a routine polygraph test in June, Schneider was asked if he ever discussed classified data with foreign nationals while in the Navy, the newspaper reported. Schneider denied doing so, but the polygraph indicated he was lying, according to

Post reports. The CIA did not formally notify the FBI and the Naval Criminal Investigative Service about the results of the polygraph until September 1995.

The newspaper quoted CIA sources who said the agency felt no urgency because interviews with Schneider indicated he was not a spy, but that he had spoken too loosely about classified material with people outside the Navy.

In the meantime, Schneider applied for a job with the State Department. He was hired and began studying at the Foreign Service Institute in Arlington in November 1995. He was awaiting assignment at the end of this month to Athens, where he was to be a consular and administrative officer. State Department officials said their own background checks turned up no "serious questions" about Schneider. He was not given a lie detector test, the officials said. But this summer, the FBI finally reported to the State Department that Schneider could be a security risk, the Post reported. The State Department immediately denied Schneider access to any facilities with classified materials, and the FBI administered a second polygraph test last month, sources told the paper. Schneider also failed that test, and the FBI referred Schneider's case to U.S. Attorney Helen Fahey for possible prosecution, sources told the Post. Susan Lloyd, a spokeswoman for the Washington field office of the FBI, declined comment on how quickly the bureau responded to the Schneider case. She said last week the FBI is notified of potential security leaks, but does not always mount full investigations.

Schneider's abandoned rental car was found in the park on Sept. 5. At the time, some family members said Schneider was upset over a setback in his career, but added he seemed to be looking forward to a new assignment in Greece. Park officials listed Schneider as missing after the remnants of Hurricane Fran stormed through the central Shenandoah Valley and caused widespread damage through the park on Sept. 6. But officials have since confirmed that investigators are looking into whether Schneider may have committed suicide. Investigators said Schneider bought a handgun before driving to the park, but the gun was not found with his other belongings.

Body Found In Park Identified October 29, 1996

Missing 6 Weeks, Man Apparently Took Own Life Daily News-Record (Harrisonburg, VA)

By PAT MURPHEY News-Record Staff Writer Shenandoah National Park officials reported that a body found Saturday apparently is a man who has been missing since early September.

Personal identification and other items found with the body Saturday indicate the dead man is James S. Schneider, 27, of Arlington, officials said Sunday.

Although the body was sent to the state medical examiner's office in Fairfax to confirm identification and determine the cause of death, park officials said the death apparently was due to a self-inflicted gunshot.

A search for Schneider was triggered last month after his car was found at the Whiteoak Canyon parking area when the park was reopened following a storm spawned by the remnants of Hurricane Fran.

The body found Saturday was on the Whiteoak Canyon Trail, about 3 1/2 miles down from Skyline Drive, park officials reported. A handgun belonging to Schneider and a suicide note were found with the body, park officials reported.

Schneider's car was spotted at the Whiteoak parking lot at milepost 42.6 on Skyline Drive when the park was being closed Sept. 5 because of the approaching storm. When road-clearing crews that were removing trees following the storm reached the parking lot Sept. 7, they found the car still there, with a park evacuation notice still on the windshield.

Searchers, including dogs and helicopters, combed the area Sept. 7-15 but found no trace of Schneider.

Park spokeswoman Lyn Rothgeb said Sunday that a hiker from Maryland found the body in a rocky area Saturday afternoon.

Rothgeb did not know what led the hiker to the body some 40 yards off the trail, but noted that the park has its biggest influx of visitors during the fall foliage season, and many people explore off the trails.

Trees and brush have lost most of their leaves now, which improves visibility, she added.

Schneider apparently had been in the park several days before his car was spotted during the evacuation sweep Sept. 5. He reportedly spent the night of Aug. 30 at the Big Meadows Lodge.

Family members said Schneider had gone to the park before beginning a State Department assignment to Athens, Greece. The Washington Post later reported that the assignment was suspended after Schneider failed two key lie detector tests.

The questions that Schneider flunked involved whether he divulged classified information to a foreign national while he was in the Navy, the Post reported.

Schneider had been a surface warfare officer on a guided missile cruiser 1992-95, and the Post said sources said he had failed polygraph tests in September 1995 and this past August.

Sources indicated that Schneider was not a spy but had spoken too loosely about classified material in conversations with people outside the Navy, the Post reported.

Unit 7
Subject Categories
Gatherer
Rattlesnake Run - Wilderness

Objective: Demonstrate overall behavioral characteristics of gatherer subjects in a wilderness context.

Text Reference: Page 178 - 182

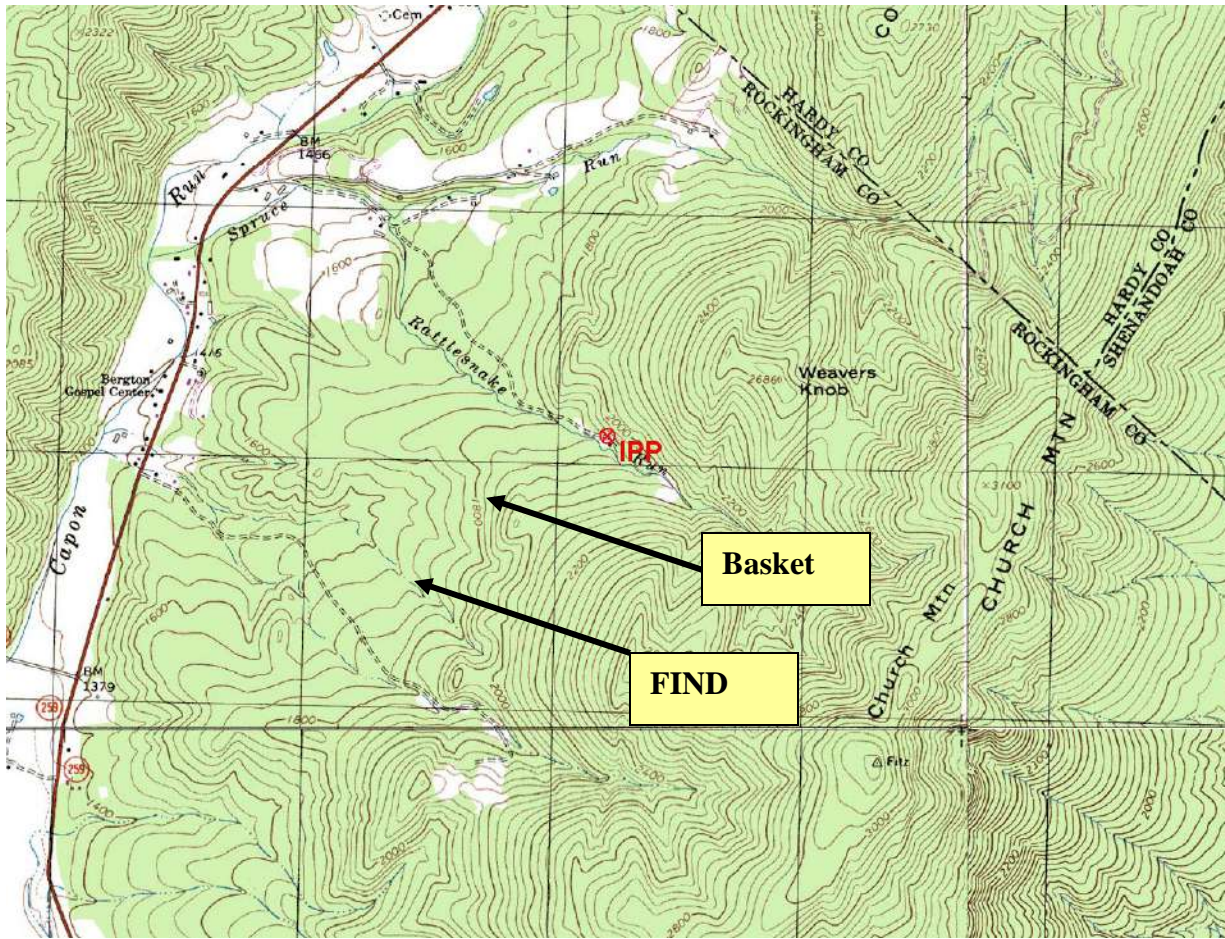
Instructor's Notes: Two elderly couples go out Sunday afternoon to go mushroom picking. Each of the couples separate. Eventually, the 68 year old wife also separates from her husband who is deaf. The husband returns to the pick-up truck which is the last location he clearly remembers seeing her (IPP). They were never that far from the pickup truck. The husband tried shouting but without any luck. He did not notice what direction she was last headed.

Additional investigative information is rather limited. Nothing suggests that either of them had dementia. She did not have any other health issues. The couple was relatively new at mushroom gathering with the other couple having more experience. It was summertime with highs in the low 90s F and late afternoon thunderstorms. Although, the search area did not receive any rain. She only has a small basket and shovel with her. They left the water and food in the pickup truck. She is not familiar with this location.

This search should be easy for the students to solve if they correctly use reflex tasking concepts. However, at the time (1980) none of these concepts had been developed.

Scenario: Two elderly couples go out Sunday afternoon to go Mushroom picking. Each of the couples separate. Eventually, the 68 year old wife also separates from her husband who is deaf. The husband returns to the pick-up truck which is the last location he clearly remembers seeing her (IPP). They were never that far from the pickup truck. The husband tried shouting but without any luck. He did not notice what direction she was last headed.

What Actually Happened: At the time, no mantrackers or tracking dogs were available. Initial efforts focused on going further upstream on Rattlesnake Run. This terrain proved to be rugged, steep, and difficult to search. **The initial effort in this area last for x days.** Eventually, the search expanded and her basket was located south of the IPP. When she got lost, she headed south contouring at the base of the mountain along the 1800 foot contour interval. After dropping her basket she continued along until coming to the first intermittent stream. She then started following the stream headed northwest. She had only traveled a few hundred meters following the stream when her ankle became jammed between two rocks. Unable to free herself, she stayed put for the duration of the incident. She had some limited access to water, but with the 90F temperatures still became somewhat dehydrated.



IPP: 38.7607069N., 078.8913523W (WGS84)

Basket: 38.758435 N., 078.8970124W

Find: 38.7553379N., 078.9003906 W

Topographic Map: Bergton, Orkney Springs, Fulks Run, Timberville, Virginia USA

Unit 7
Subject Categories
Hiker
Old Rag Mountain - Wilderness

Objective: Demonstrate overall behavioral characteristics of hiker subjects in a wilderness context.

Text Reference: Page 183-188

Instructor Notes: The hiker profile is also used in the decision map scenario and the punchbowl incident. Those situations represent the more typical lost hiker scenario. This particular scenario is a meld of hiker, spontaneous day “climber”, and perhaps adolescent behavior (even though the subject was 18). From a lost person behavior perspective the most likely scenario is in fact what happened to the subject. However, it can lead to a good discussion on methods to implement the strategy. The case can also lead to a good discussion on what subject category the subject should be placed.

Four 18-year-old college students decided to hike to the summit of Old Rag Mountain and then turn around and return to the trailhead parking lot. However, once at the summit the subject bets his friends he could beat them back to the car. The friends returned via the ridge trail three hours later to the parking lot. The subject took out his compass set it on North and planned to go cross-country to the Weakley Hollow road and then return to the parking lot. He was last seen on the summit getting ready to head North at noon. It is October, 45 F, high winds, and heavy rains are forecasted.

The subject was a healthy 18-year-old but had suffered a dozen broken bones over his childhood. None of these fractures were from pathological factors but instead from daredevil activities such as bicycle riding, skateboarding, climbing trees, etc.

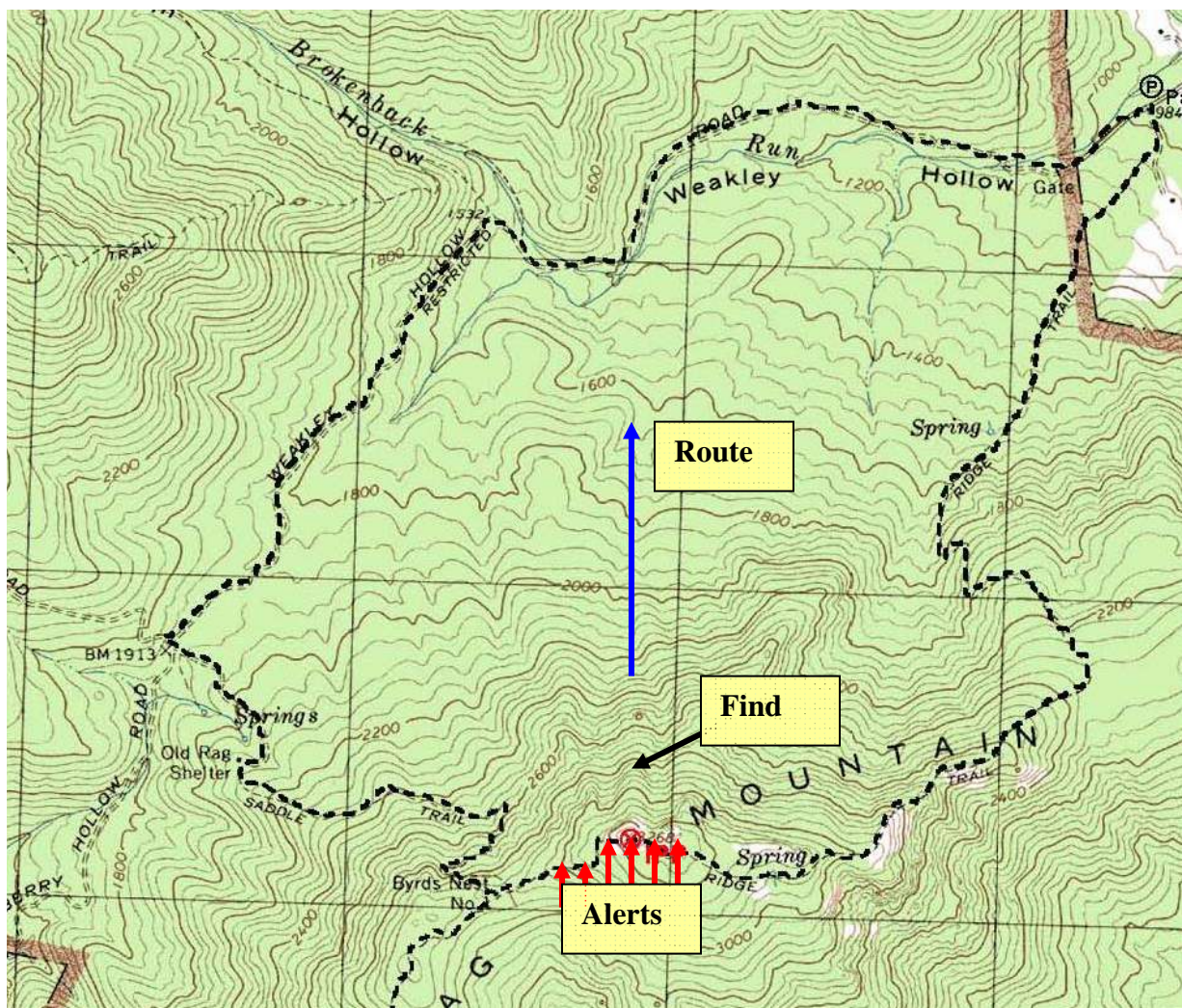
The subject is dressed in jogging shorts, a polo shirt, and a sweater. He is wearing old tennis shoes. Other than a compass he has no other gear with him. He has been on previous hikes but no survival or navigation training or experience.

The summit of Old Rag Mountain is filled with large boulders, ledges, cliff faces, and mountain laurel thickets. Soon after the search started a 1,000 foot ceiling developed around the 3268 foot mountain. Visibility dropped to about 40-feet. A picture is included that shows the summit along with an aerial overview.

Scenario: Four 18-year-old college students hike to the summit of Old Rag Mountain and then turn around and return to their car. However, at the summit the subject bets his friends he can beat them back to the car. The friends returned via the ridge trail three hours later to the parking lot. The subject took out his compass set it on North and planned to go cross-country to the Weakley Hollow road and then return to the parking lot. He was last seen on the summit getting ready to head North at noon. It is October, 45 F, high winds, and heavy rains are forecasted.

What Actually Happened:

Early on in the search the weather deteriorated. The 40-foot visibility made it difficult for experienced search and rescue personnel familiar with the ridge trail to navigate it successfully. Air-scent dogs were getting strong alerts near the summit but could not leave the trail safely or pin point his location with the strong variable mountain top winds. Eventually five two-person vertical teams started a “line” search of the summit area. Each team was in sight of each other. One of the searchers was at the end of her rope but thought she saw something on a ledge further below. So she untied her end-knot and tied on some additional webbing to rappel an additional 20 feet and spotted the subject semi-conscious on a ledge underneath some mountain laurel. He was found 250 feet below the top of the mountain. He was suffering from hypothermia, several broken ribs, and a head injury which was causing convulsions. The technical/semi-technical evacuation took 11 hours and hundreds of rescuers. He survived the ordeal.



IPP: 38.5516685 N., 078.3160409 W

Find: 38.552450 N., 078.314877 W

Topographic: Old Rag Mt, Virginia USA

Unit 7
Subject Categories
Hunter
Rapidan - Wilderness

Objective: Demonstrate overall behavioral characteristics of hunter subjects in a wilderness context.

Text Reference: Page 193-198

Instructor Notes: This particular search is somewhat unique since it reflects the medical scenario instead of a lost scenario. It is also somewhat unique in the fact the IPP was not precisely known. Participants who have mastered reflex tasking should have no problem making a fast find. For that very reason this problem might be better suited for the presentation technique of passing out the map and letting students work on it in small groups or individually. All students should be able to locate the subject and it will be instructive to see overall strategies.

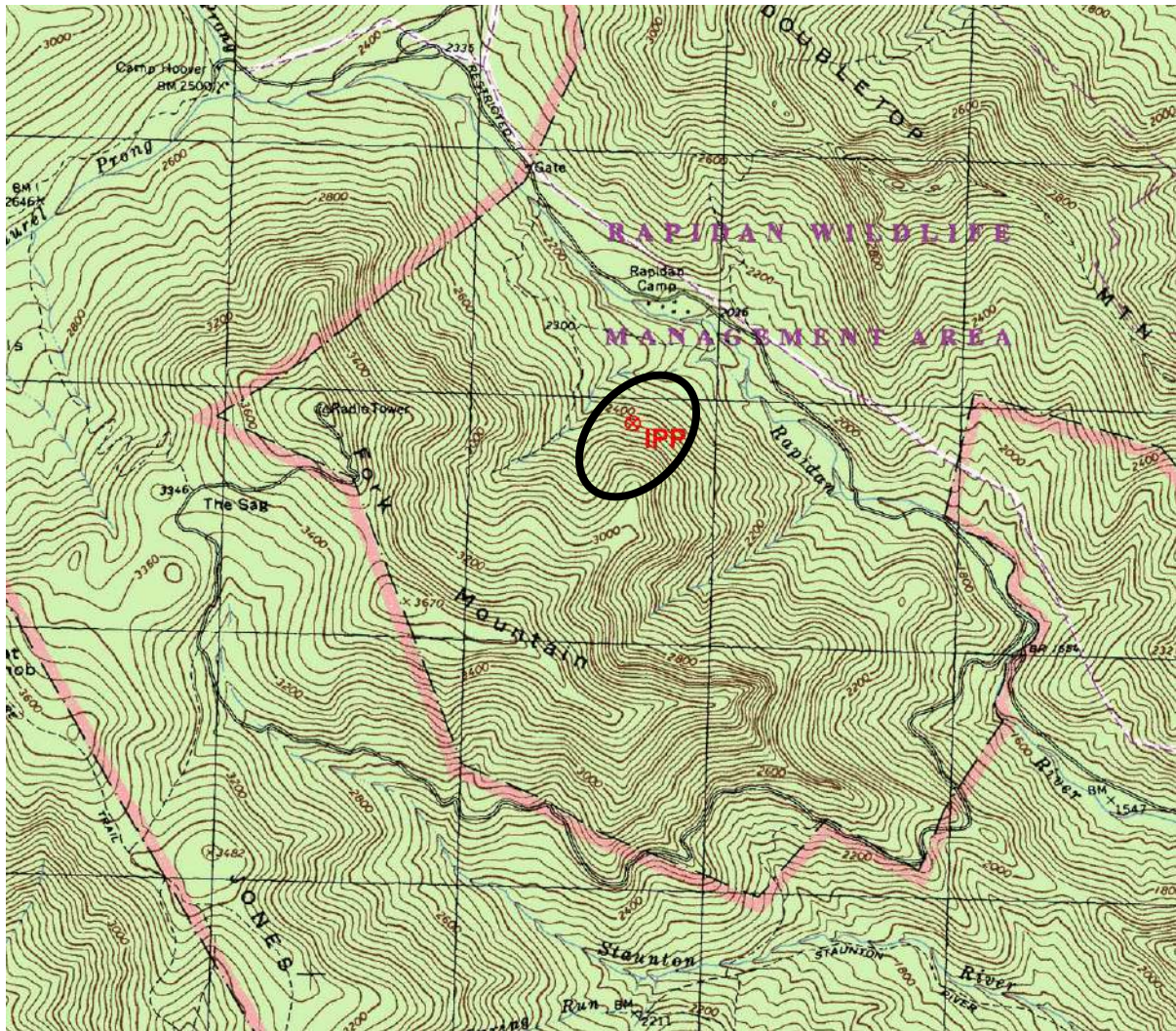
A party of six is bear hunting. The group breaks up into pairs. The plan is to drive any bears to a waiting hunter. A 52-year-old male traveling uphill starts to feel a little winded and tells his hunting partner that he will rest for just a little bit and then catch back up. He was last seen at 09:00. They never meet back up and he does not return to the cars that are parked along the Rapidan Road. The hunting partner is not able to determine exactly on the map where he last saw the subject but can indicate a general area. The group spent the day much higher on the mountain and then returned to their cars at 16:30. It is December with highs of 45F and low of 25F. No snow is on the ground.

The subject has no physical ailments and is in average shape, which is not adequate for climbing the mountains. He is well dressed for hunting. He is wearing a flannel shirt, sweater, insulated overalls, and a jacket. He is wearing a hat and gloves. He is carrying a rifle, a handful of shells, a bottle of water, some snacks, a package of cigarettes, and a lighter. He has high blood pressure and high cholesterol for which he is taking medication. He has hunted in this area before and knew that all he needed to do was travel downhill to the road. He does not have a map or compass. He does not have a cell phone, nor is any coverage available.

The student map on the PowerPoint slide simply indicates the general area his hunting partner pointed out as being the possible IPP. Which he described as “walking up the ridge” and staying out of the drainage. He is willing to try to locate the IPP again on foot, but not sure if he can do it. The hunting party did fire shots, but got no response. The hunting party was not likely to hunt in the National Park and would stay in the Wildlife Management area.

Scenario: A party of six is bear hunting. The group breaks up into pairs. A 52-year-old male traveling uphill starts to feel a little winded and tells his hunting partner that he will rest for just a little bit and then catch back up. He was last seen at 09:00. They never meet back up and he does not return to the cars that are parked along the Rapidan Road. The hunting partner is not able to determine exactly on the map where he last saw the subject but can indicate a general area. The

group spent the day much higher on the mountain and then returned to their cars at 16:30. It is December with highs of 45F and low of 25F. No snow is on the ground.



IPP: The IPP is not a discrete point but instead really everything inside the circle

Find: The find was the same as the IPP. 38.4785 N., 078.4013 W (WGS84)

What actually happened: One major difficulty with the search was simply locating the ICP location which was with the parked cars from the hunters. A search then drove up to the park boundary and used the odometer to measure the distance along the road (search occurred well before the days of GPS). The friend who last saw the subject was interviewed extensively but could not read a topographic map. A sweep team which included the friend was sent up the ridge. The subject was soon located at the same tree where he was last seen. He had died of a massive heart attack. He did not fire off any shots.

Unit 7
Subject Categories
Mental Illness
Panorama

Objective: Demonstrate overall behavioral characteristics of mental illness subjects in a wilderness context. Demonstrate how to handle multiple subject categories.

Text Reference: Page 199-205 and 321-326

DVD Reference: Six reference documents found in LPB DVD

Software Reference: Excel Spreadsheet – Scenario Weighing.xls

Instructor Notes: The same map contains two separate incidents that involved mental illness. Each incident is treated as a separate case study. The first case is well documented in Chapter 10 – Summary of the *Lost Person Behavior* book. In fact, some students may have actually read the case study prior to the class. The book gives the general location the subject was found but does not give the specific location of the find. If the book was passed out at the beginning of class you will find most students will not have read this section yet. It may be prudent to remind any student that does know the answer to not blurt out the solution.

A 45-year-old male with a history of mental illness has been progressively getting worse. He has reported auditory hallucinations to his fiancée. It appears he has stopped taking his medications. The family does not approve of the fiancée and this is an additional source of stress. The previous weekend he attempted to drive to a national park in order to find a cliff to jump off. So he and his fiancée set out to find a national park. Departing from Fredericksburg, VA (50 miles away from the IPP) they could not find the park due to foggy conditions, no planning, and no map. A week later on Sunday he and his fiancée once again set out for the national park. They park the car inside the park in the parking lot of a defunct restaurant, which he had visited earlier. He has no knowledge of the park, or the area, no maps, or hiking experience. He hands over all of his cash to his fiancée, grabs a small bottle of water, and tells her “now I will be able to get ahead of them.” and heads directly into the woods, not along any path or trail. It is now 18:00, the fiancée quickly calls 911; her call is routed to the National Park Service and the search begins.

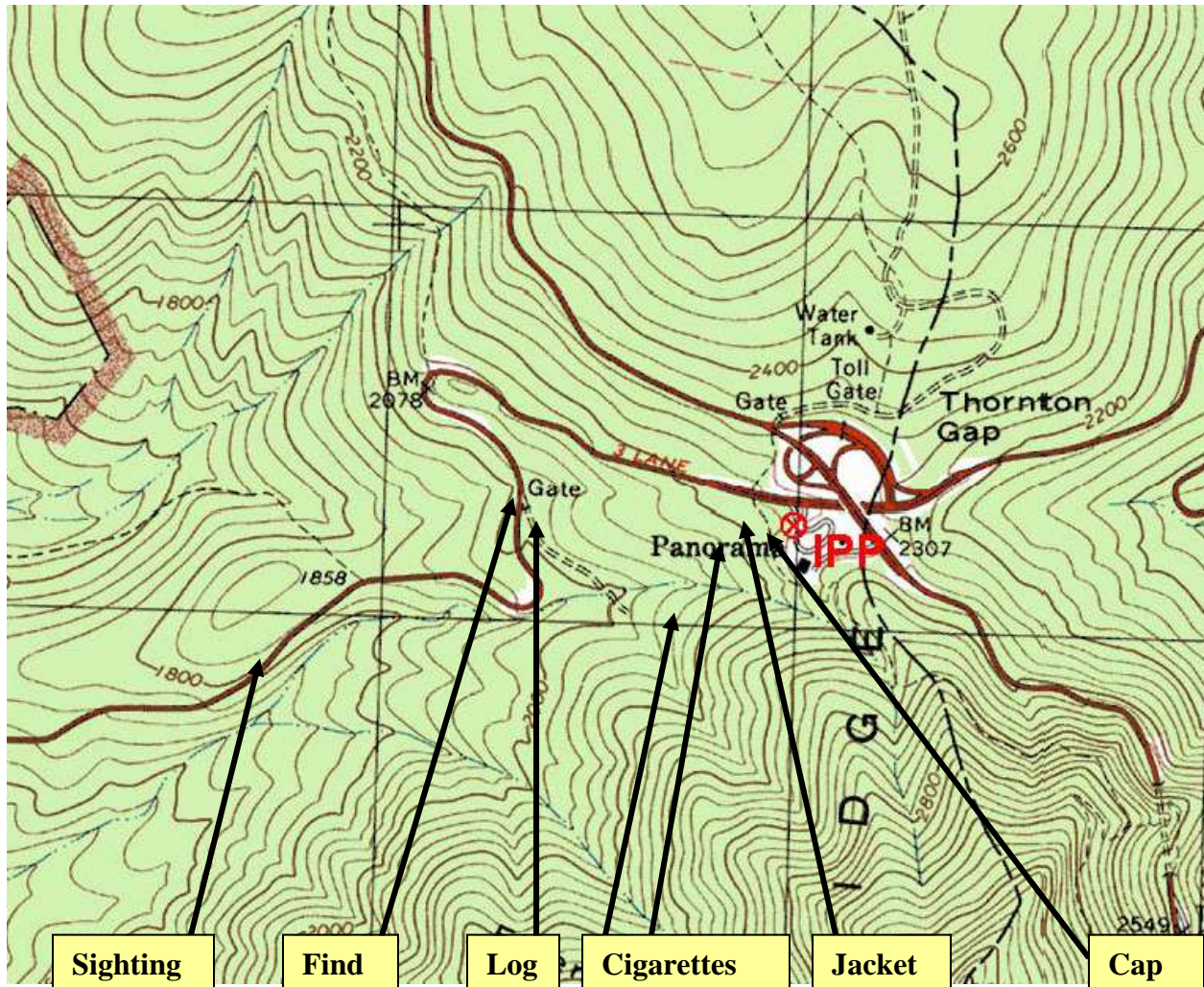
This search provides an excellent opportunity to have some discussion of the difficulty of determining the subject’s category. Since elements of both despondent and mental illness are present, both must be considered. Options include, choosing only one, giving both equal weight, or giving one scenario more weight than the other. Giving one scenario more weight is easily accomplished by a simple spreadsheet. The user simply enters the distances for two or more subject categories that seem relevant. Then they assign the percentage factor they think is appropriate for each subject category. In this case three different subject categories are considered, despondent, mental illness, and hiker. In reality, hiker is shown simply as an example. The chance the subject is showing behavior similar to a hiker is so low it does not really warrant the 1% chance it is assigned. The bottom line is no correct answer exists for how much weight should be given category. The despondent category cannot be rejected since he did

mention the desire to jump off a cliff. Those with mental illness are also associated with increased risk of suicide. Although his plan to drive to a national park with mountains shows some planning, it is weak planning at best. The park lacks significant cliffs that are easily accessible and one would need to use a map to reach them. The lack of medications, worsening hallucinations, and his last comment to his fiancée are more indicative of mental illness. Additional investigative information also indicated that the subject would not be a threat to searchers.

Scenario Weighing			
Distance (horizontal) from IPP (kilometers)			
	Despondent	Mental Illness	Hiker
n	103	23	568
25%	0.3	0.6	1.1
50%	1.1	2.3	3.1
75%	3.2	8.3	5.8
95%	21.6	14.6	18.3
Scenario Factor	10%	89%	1%
(give %)			100% Must equal 100%
	Result		
25%	0.6		
50%	2.2		
75%	7.7		
95%	15.3		

What actually happened: Initial tasks included tracking/trailing dogs, man-trackers, a search of the immediate area and structure, and hasty tasks along the trails. That night a passing motorist calls in a report of a suspicious looking person with a terrified look in his eyes when caught by the car's headlights. The person runs off into the woods wearing only a t-shirt. The subject was last seen wearing a jacket over a t-shirt. The following morning, man-trackers find a location along the road (sighting) where someone had scurried up the embankment and then sat down on a log a few yards away from the road. Locale searching at the initial planning point also finds the subject's baseball cap, jacket, water bottle, and cigarettes in a line leading from the IPP to the sighting. The area around the sighting is search by air-scent dogs, tracking/trailing dogs, and ground searchers. The tracking/trailing dogs trail which starts at the IPP goes to the location of these clues, onto the location of the sighting, back across the road, and then is lost. On day five of the search 114 hours after the subject was last seen, the team assigned to search the highest probability segment shines a flashlight into a culvert under the road. Two bright eyes reflect back. The searcher initially thinks it might be a raccoon, but as the searcher's eyes adjust, he realizes it is a human. The searcher calls out the subject's name, and he responds in the affirmative. A cold, hungry, and scratched subject is then evacuated to a hospital for observation.

During the interview the subject recounts how he actively hid from searchers and saw several teams go by. The culvert he was located in had been searched before. While he was in nearly constant motion, he never traveled that far from the original sighting and find location. Once back on his medications he thanks the searchers for the effort.



IPP: 38.6601604 N., 078.3220907 W. (WGS84)

Sighting: 38.657056 N., 078.3369004 W

Jacket: 38.6602812 N., 078.3233395 W

Cap: 38.6601604 N., 078.3226384 W

Cigarettes 1: 38.659776 N., 078.3240844 W

Cigarettes 2: 38.6582290 N., 078.3254213 W

Impression on log: 38.6599362 N., 078.329234 W

Find: 38.6610055 N., 078.3296930 W.

Unit 7
Subject Categories
Mental Illness
Panorama – Turn Bridge Trail

Objective: Demonstrate overall behavioral characteristics of mental illness subjects in a wilderness context. Demonstrate how even some mental illness cases will respond to searchers.

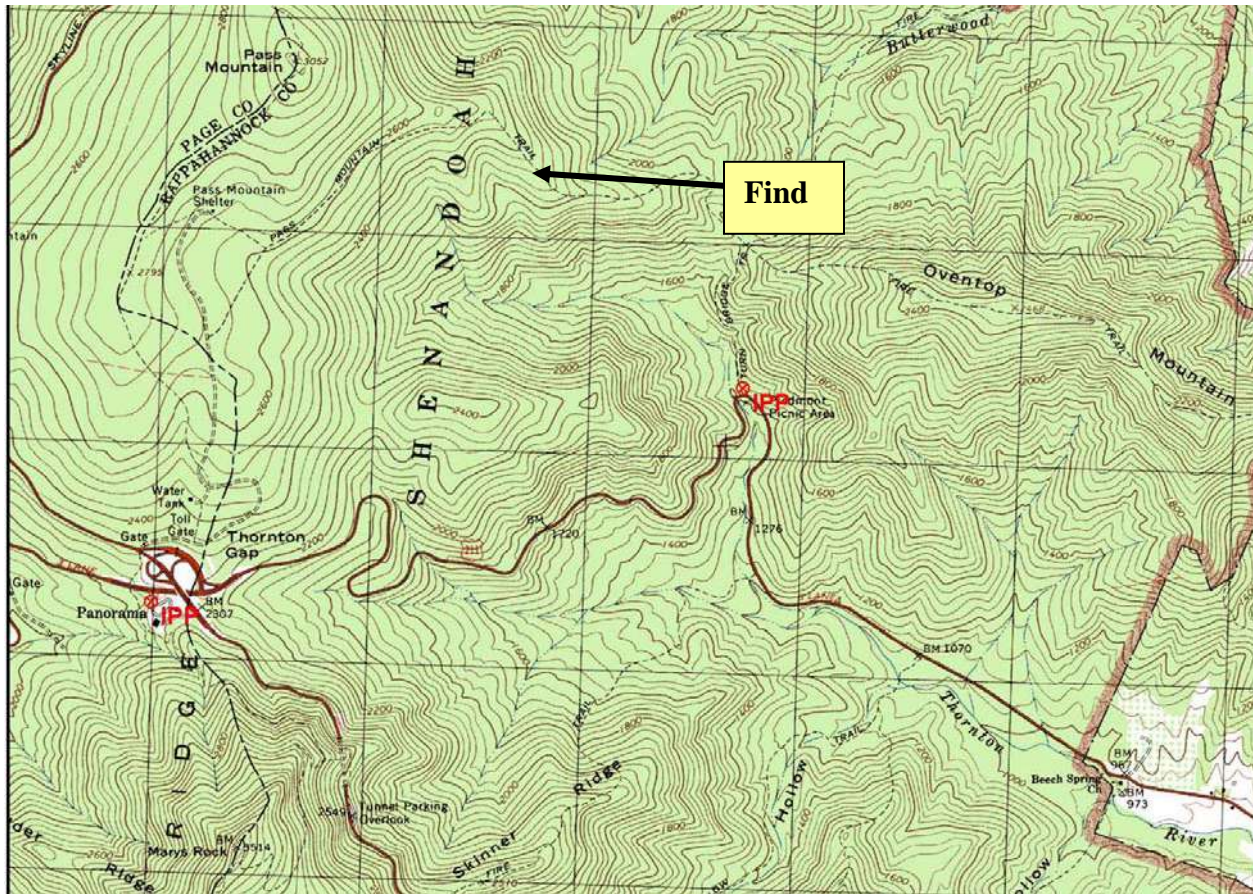
Text Reference: Page 199-205

Instructor Notes: Few details are available for this search, mostly because the search was over so quickly. Reflex tasking was the key to a quick find. In addition, the search is noteworthy since it is a rare instance when someone with mental illness was responsive to searchers. It is important to point out to participants that usually is not always. Since this is such an easy problem it is best presented as a class problem. It should not be presented as the only example of a mental illness case study since it is much easier than most.

A motorist driving along US 211 which cuts through a national park spots what appears to be at first a deer. Upon closer examination it is a naked man running into the woods. It is 19:00 in January; the current temperature is 25 F. A cold front is moving in and the temperature is expected to drop quickly to 10 F with 20mph winds. The National Park Service is notified along with the State Police. The naked man was spotted at the Turn Bridge Trail trailhead where his vehicle is parked. An examination of his vehicle shows it has been completely torn apart inside. Running the plates reveals it belongs to a 21-year-old male with a history of mental illness. He has no other medical issues. He has no history of depression. He has been off his medicines the last week. His whereabouts are unknown and his parents report he has been acting strangely the last few days. He was last seen heading in the direction of the trail.

Scenario: A motorist driving along US 211 which cuts through a national park spots what appears to be at first a deer. Upon closer examination it is a naked man running into the woods. It is 19:00 in January; the current temperature is 25 F. A cold front is moving in and the temperature is expected to drop quickly to 10 F with 20mph winds. The IPP is a trailhead where his vehicle is also parked.

What actually happened: He was found by a hasty team running the Turn Bridge Trail, 1.5 miles (2.4 km) from the trailhead. He was 30 yards off the trail, no longer moving. He was found within 2 hours of being spotted. He shouted when he spotted the headlights of the search team. If he had not shouted it is doubtful he would have been spotted. He currently would not have survived if not found by the first team. An air-scent dog was part of the team, but did not alert prior to him shouting.



Note: The Oventop fire road and Butterwood fire trail no longer exist. The only trail that now exists from the trailhead is the Pass Mountain Trail.

IPP: 38.6691280 N., 078.2904507 W

Find: 38.6777164 N., 078.3006614 W

Topographic Map: Thornton Gap, Virginia, USA

Unit 7
Subject Categories
Mental Retardation
(Intellectual Disability)
Lakeland Village

Objective: Demonstrate overall behavioral characteristics of mental retardation (intellectual disability) subjects in a rural context. Demonstrate the statistical distribution of other cases that have the same IPP in common.

Text Reference: Page 206-213

DVD References: Mental Retardation (Intellectual Disability) Folder – Fact Sheet

Other Reference: Original Map Problem from Instructor’s Suite for Managing Land Search Operations (2007) by ERI Publications and Training. www.eri-online.com

Instructor Notes: This map problem has been taken (with written permission) from *The Instructor Suite: For Managing Land Search Operations* (2007) by ERI Publications & Training. The DVD provides extensive additional information and provides the framework for several additional assignments and learning opportunities. This disk is worth the expense (\$650 USD), if within your budget.

Depending upon your audience you may use the term “mental retardation” or “intellectual disability.” The term “intellectual disability” is intended to be synonymous with mental retardation and may be more acceptable for general conversation. The more medically correct term as defined by DMS-IV-TR and the World Health Organization is currently Mental Retardation. Instructors should use their best judgment.

This problem can be conducted either has a class or as a small group exercise. Since it is potentially the last map problem if time permits an individual exercise would also be appropriate.

In presenting this incident, the important learning point isn’t where the subject was found (which is a classic location) but where all of the various subjects were found. It is also an excellent opportunity to point out the data in the find location. The dry data for Mental Retardation does not include the cases found in this case study. Therefore, the nine cases presented here serve as a validation check on the other ten cases. A slide shows the comparison.

A 15-year-old male was last seen at 10:00 just outside his dorm room by his counselor after a group outing. They had been playing follow the leader, tag, and ring around the Rosey on the south lawn. They also played on the playground equipment. The counselor had everyone wait at the entrance to the dorm’s ramp as he went to open the door. Once everyone had filed in the subject who had been taking up the rear was no where to be found. None of the other children are a reliable witness and no direction of travel can be obtained by a witness. Tracking resources will not be able to obtain a direction of travel either. He is a resident of Lakeland Village which houses those with mental retardation or intellectual disability. He has never runaway or been missing before. He knows his way around the facilities well. He has not been punished or upset

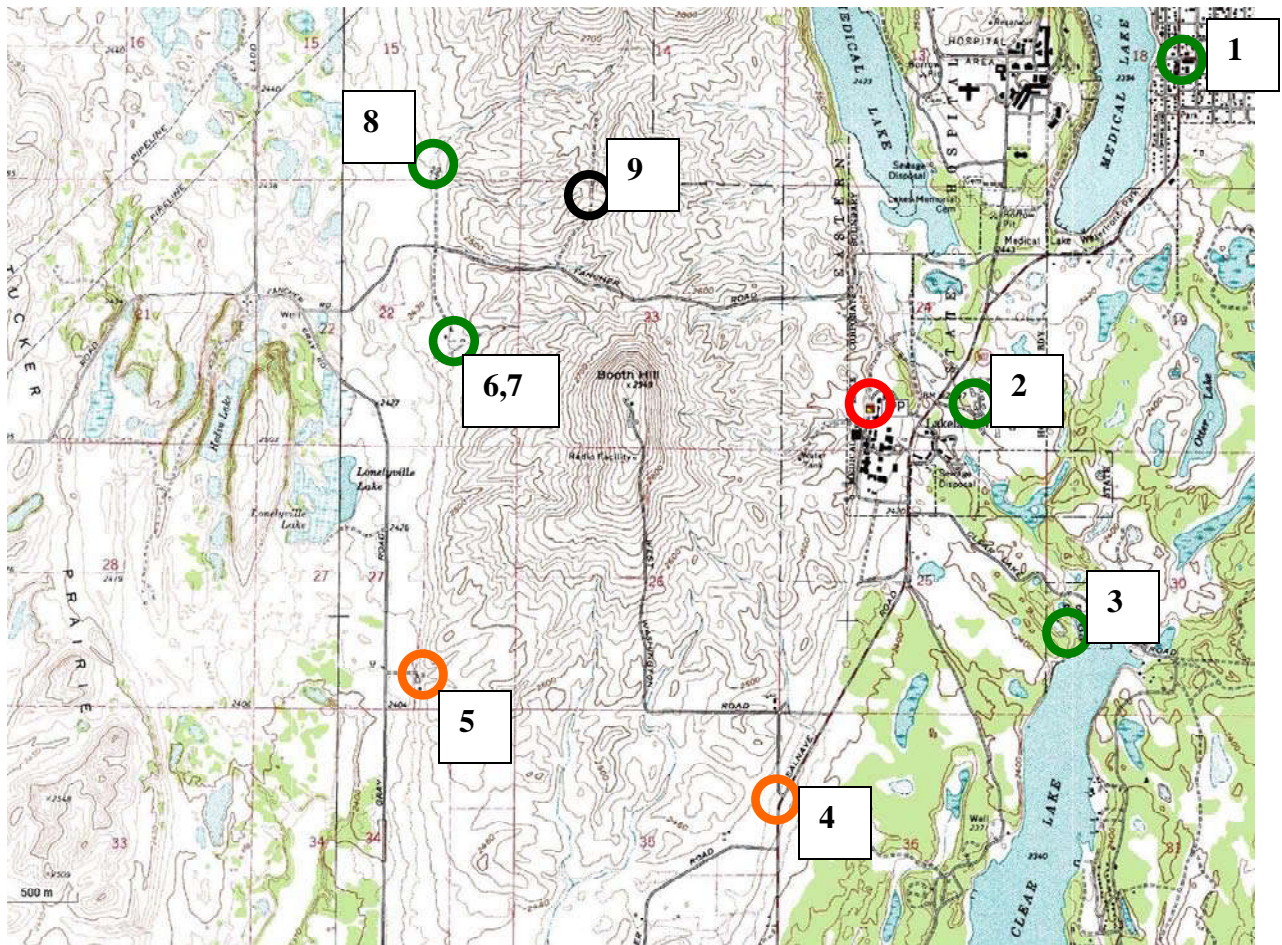
over anything. He is alert, attentive, moderately outgoing, and at easy around people, but very shy around strangers. He has no other medical problems. He has normal energy and fitness for a 15-year-old. He is not attracted to anything unusual, but he does like animals.

The current temp is 45 F (7 C) with an expected low of 25 F. It is October and he is dressed in street shoes, lightweight clothing, heavy coat, and a blue stocking cap. It is now 12:00 after a search of the grounds by the staff.

Scenario: A 15-year-old male was last seen at 10:00 just outside his dorm room by his counselor after a group outing. He is a resident of Lakeland Village which houses those with mental retardation or intellectual disability. The current temp is 45 F (7 C) with an expected low of 25 F. It is October and he is dressed in street shoes, lightweight clothing, heavy coat, and a blue stocking cap. It is now 12:00 after a search of the grounds by the staff.

What actually happened: The incident commander had gathered the previous locations subjects from Lakeland Village had been located. Therefore, the IC called all the ranchers to have them check their barns. The ranchers called back and said no one was in the barn. The IC then sent SAR resources to follow up and the subject was found in the barn, sleeping in the hay.

Learning Points: Subject might have the learning rate of a 1.5 year old, but has a 15-year-old physical capability. Don't trust staff or public when they say that have searched a facility. A combined team (SAR and public) is often the best approach. High urgency (previous fatality) along with hazardous weather. Investigation always important (subject not likely to be responsive to SAR team).



IPP: 47.556686 N., 117.706606 W. (WGS84)

Finds:

- 1) Male playing at McDonalds in the play area.
- 2) Male petting animals at the petting zoo.
- 3) Male playing at park (playground and wading area)
- 4) 16-year-old Female laying naked in middle of the road.
- 5) 18-year-old Male started fire in barn because he was cold.
- 6) Male playing in barn
- 7) 15-year-old male sleeping in hay found in barn (subject) 47.556808 N., 117.741054 W
- 8) Female knocked on farmer's door asking for water.
- 9) Female found dead from hypothermia along road.