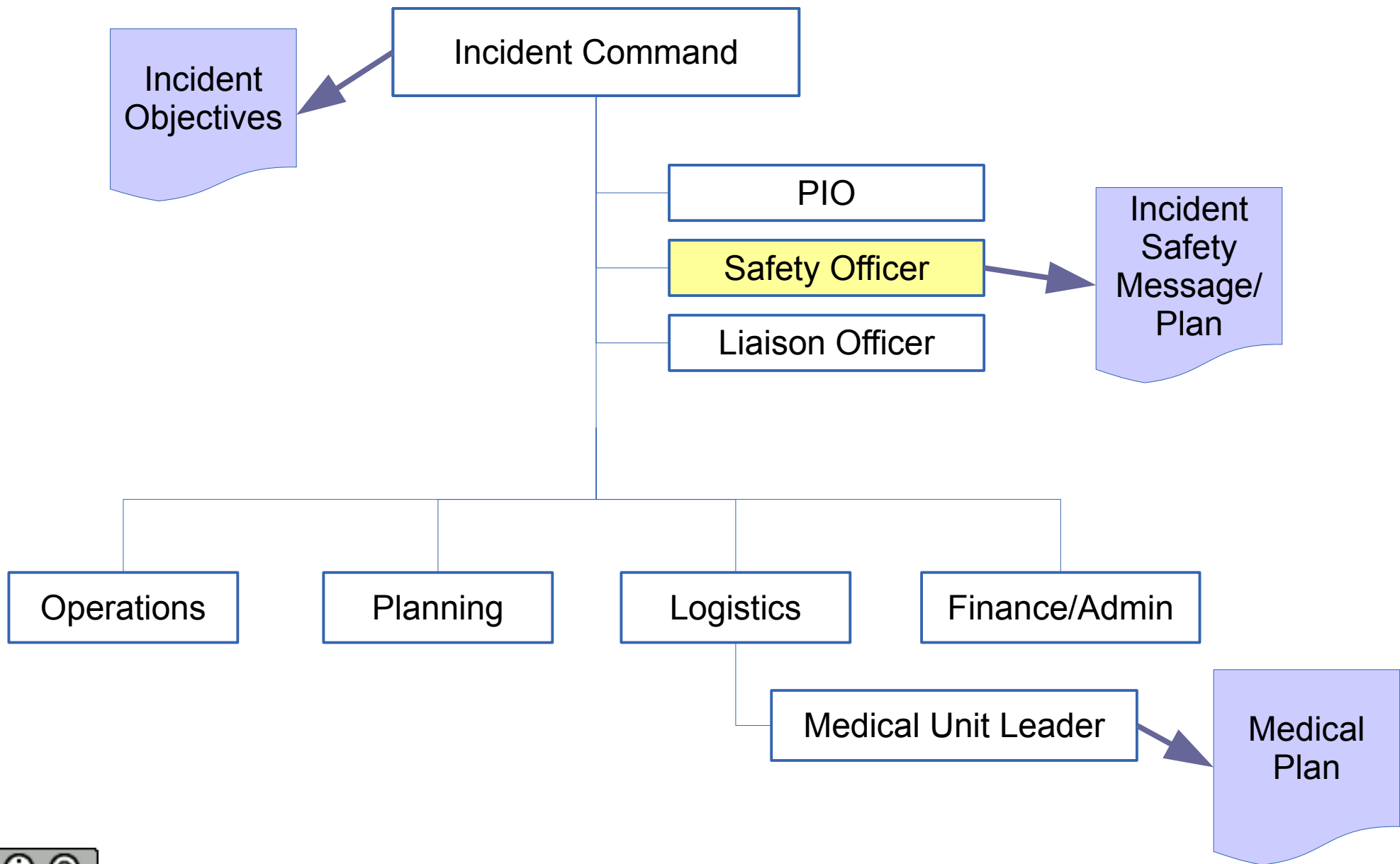




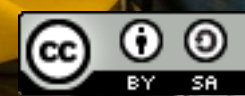
Hazards and Risk Mitigation

- Goal: Everyone goes home safe.
- Objective: Ensure the safety of all responders and the general public throughout the entire duration of the incident.
- Follow a Risk Management Process

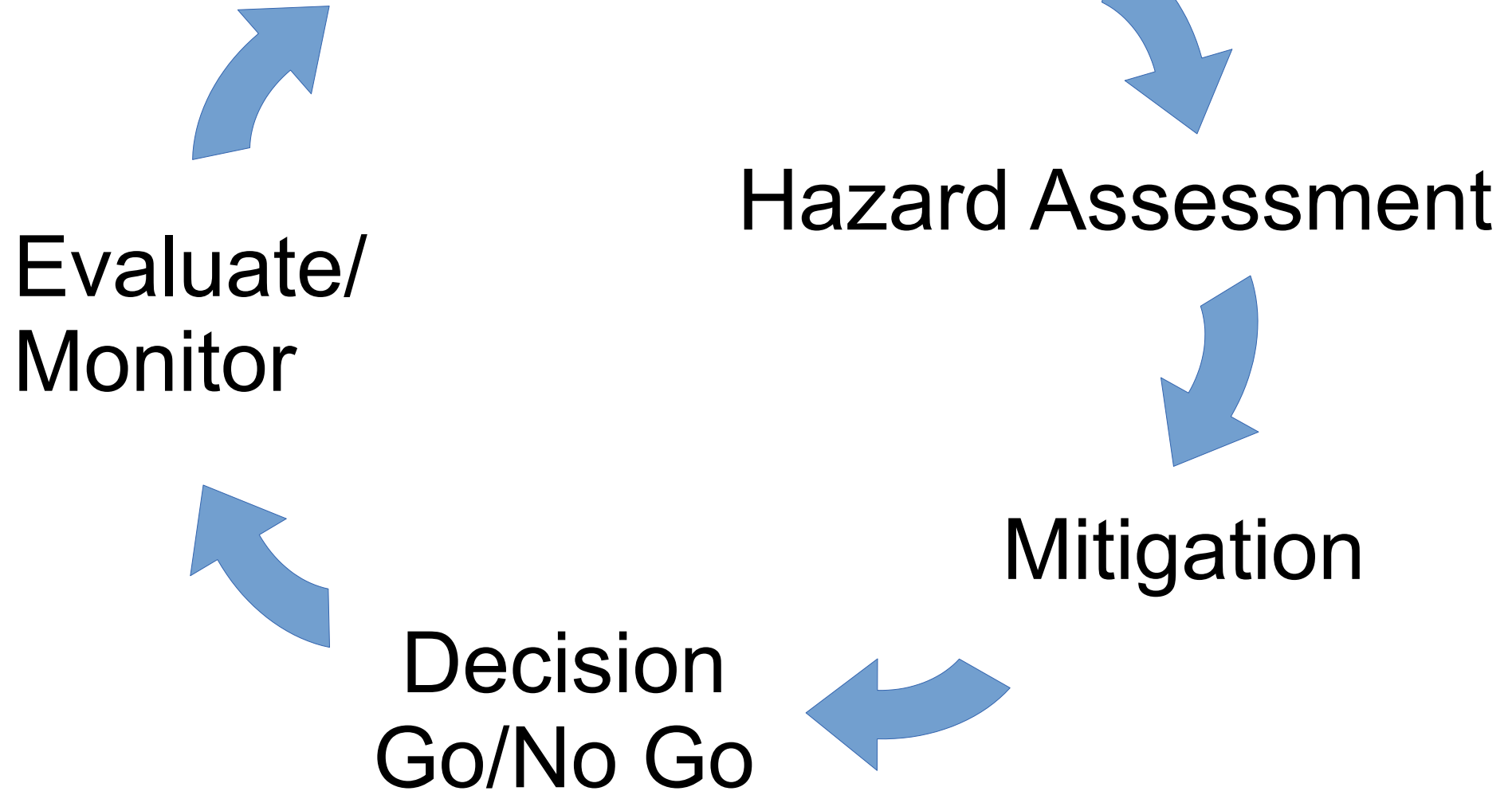




Branch Director Todd Abel and and Safety Officer Pete Stewart.
Photo by Kari Greer.
Credit US Forest Service Gila National Forest



Situational Awareness

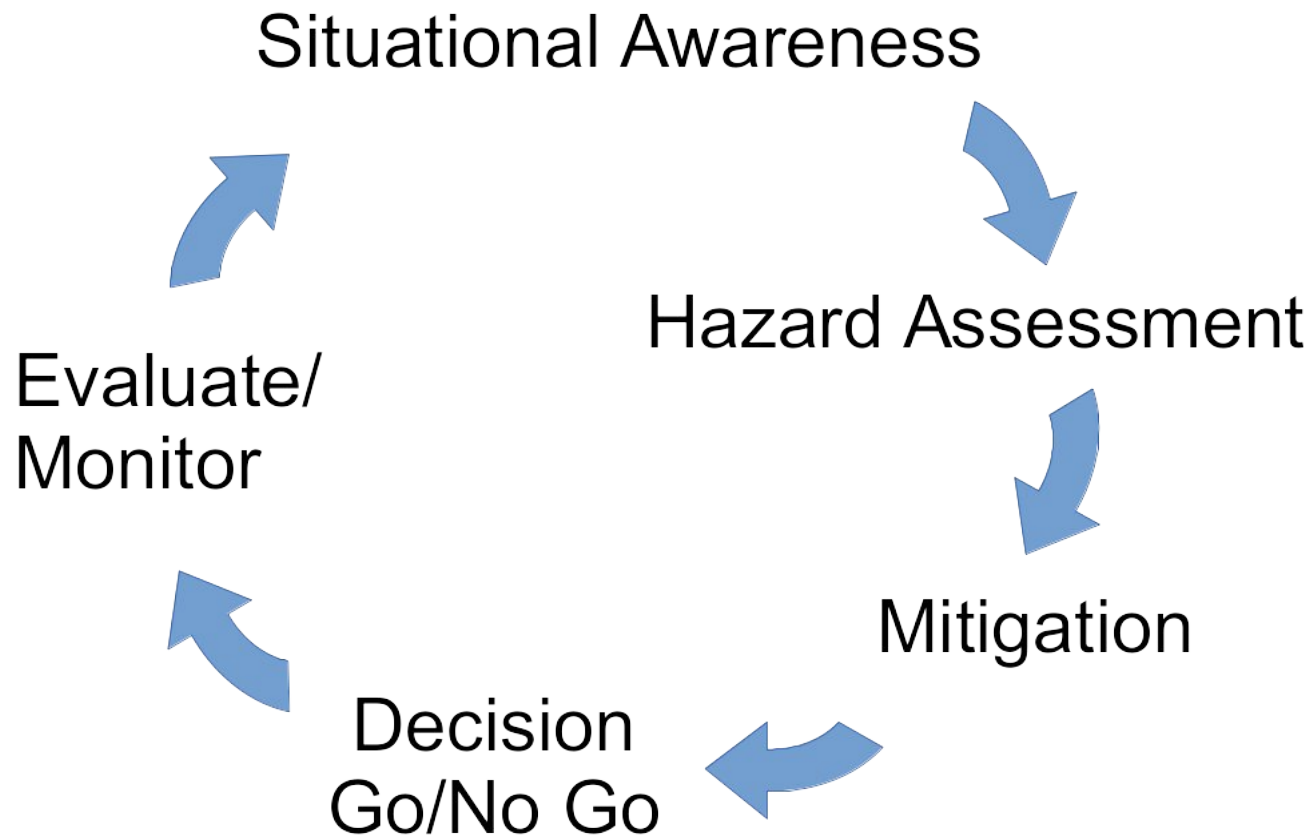


Operational Risk Management

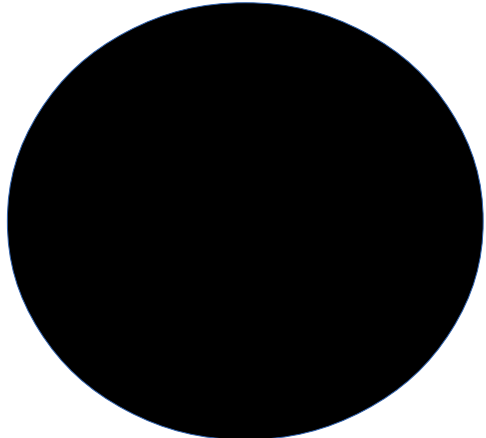
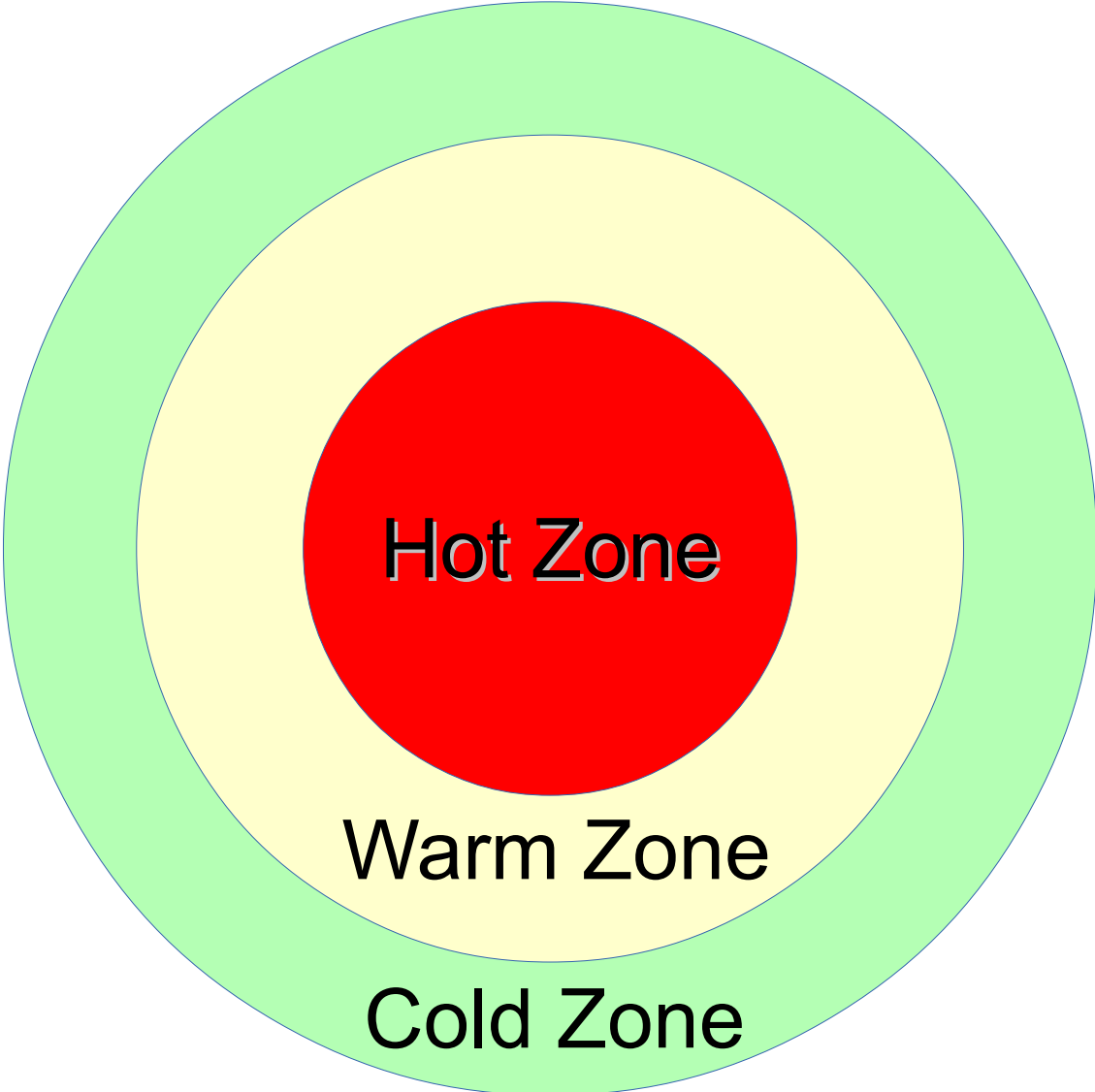
- 1) Accept No Unnecessary Risk
- 2) Accept Necessary Risk When Benefits Outweigh Costs
- 3) Make Risk Decisions at the Appropriate Level
- 4) Integrate Operational Risk Management into Operations and Planning at All Levels

Talk it through

- Out loud
- Make Risk Decisions at the Appropriate Level



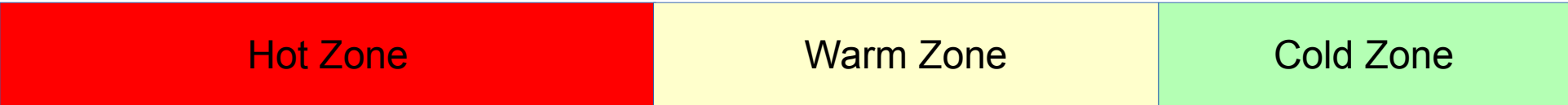
Control Zones



Exclusion Zone
Nobody Enters

Control Zones

Public



Appropriate PPE
And Assigned Task



Supporting
Hot Zone
Operations



Hot Zone

Warm Zone



Accountability

Hot Zone

Warm Zone

Cold Zone

←
Tag In

←
Sign In

Accountability Board
Tag in/out Board
Who is in the Hot Zone

ASSIGNMENT LIST (ICS 200)

This form is used to track personnel assignments. It includes fields for Incident Name, Incident Number, Incident Location, and Incident Date. It also has a table for listing assignments with columns for Name, Position, and Status. The form is partially obscured by a green vertical bar and a yellow vertical bar.

INCIDENT CHECK-IN LIST (ICS 211)

This form is used to track personnel check-ins. It includes fields for Incident Name, Incident Number, Incident Location, and Incident Date. It also has a table for listing check-ins with columns for Name, Position, and Status. The form is partially obscured by a green vertical bar and a yellow vertical bar.

Assignments:
Who is supposed to
be in the Hot Zone



Everyday Hazards & Mitigation

- Ticks: Recognition, insect repellent, light colored clothing, gaiters, tick checks.
- Poison ivy: Recognition, long pants, long sleeves, avoid sweaty thin clothing, barrier creams, poison ivy scrubs.
- Low branches: Wear safety glasses at night.
- Dehydration: Drink lots of water, carry lots of water.
- Sun exposure: Sunscreen, sunglasses, clothing.
- Uneven footing: Boots with ankle support.



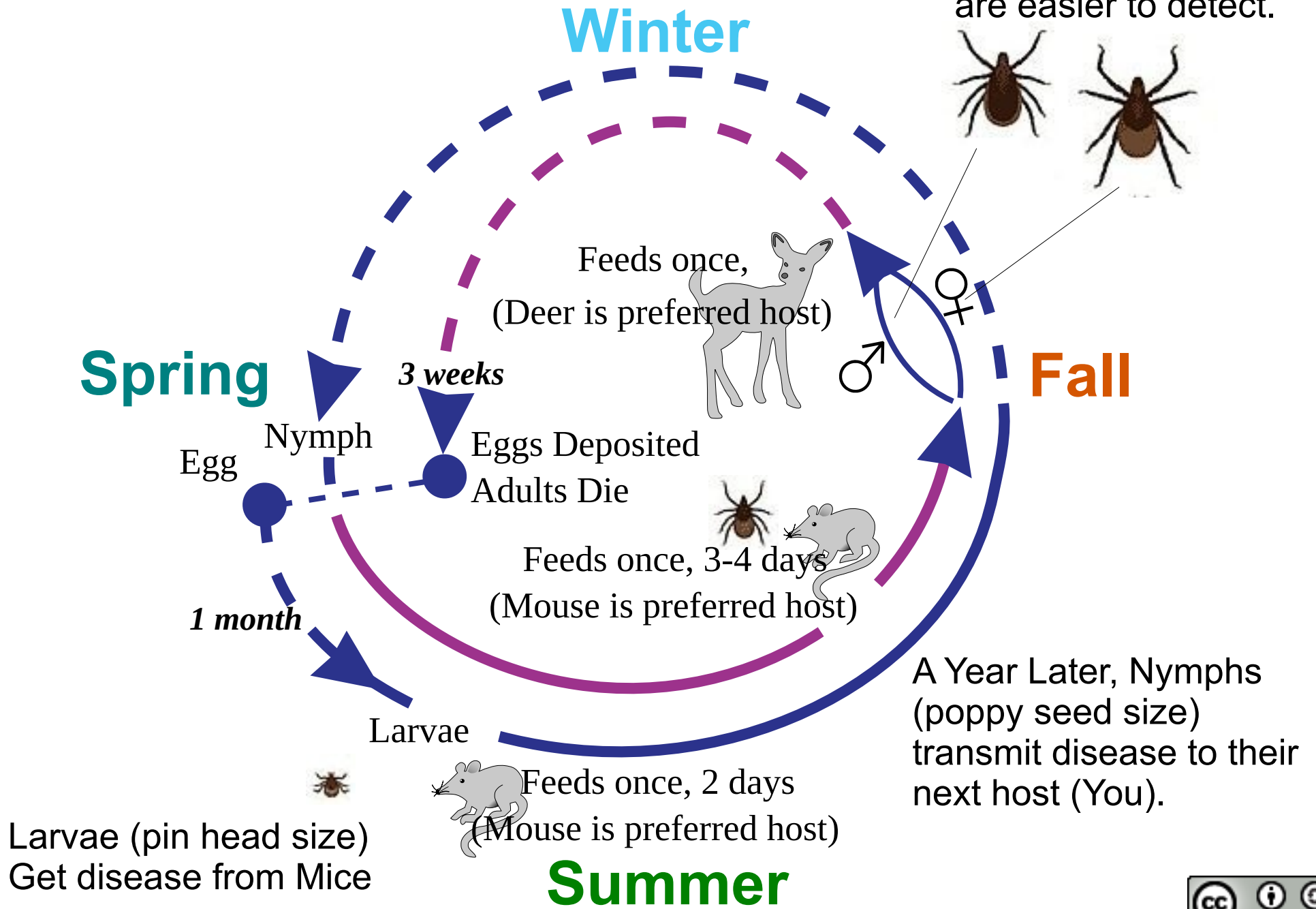




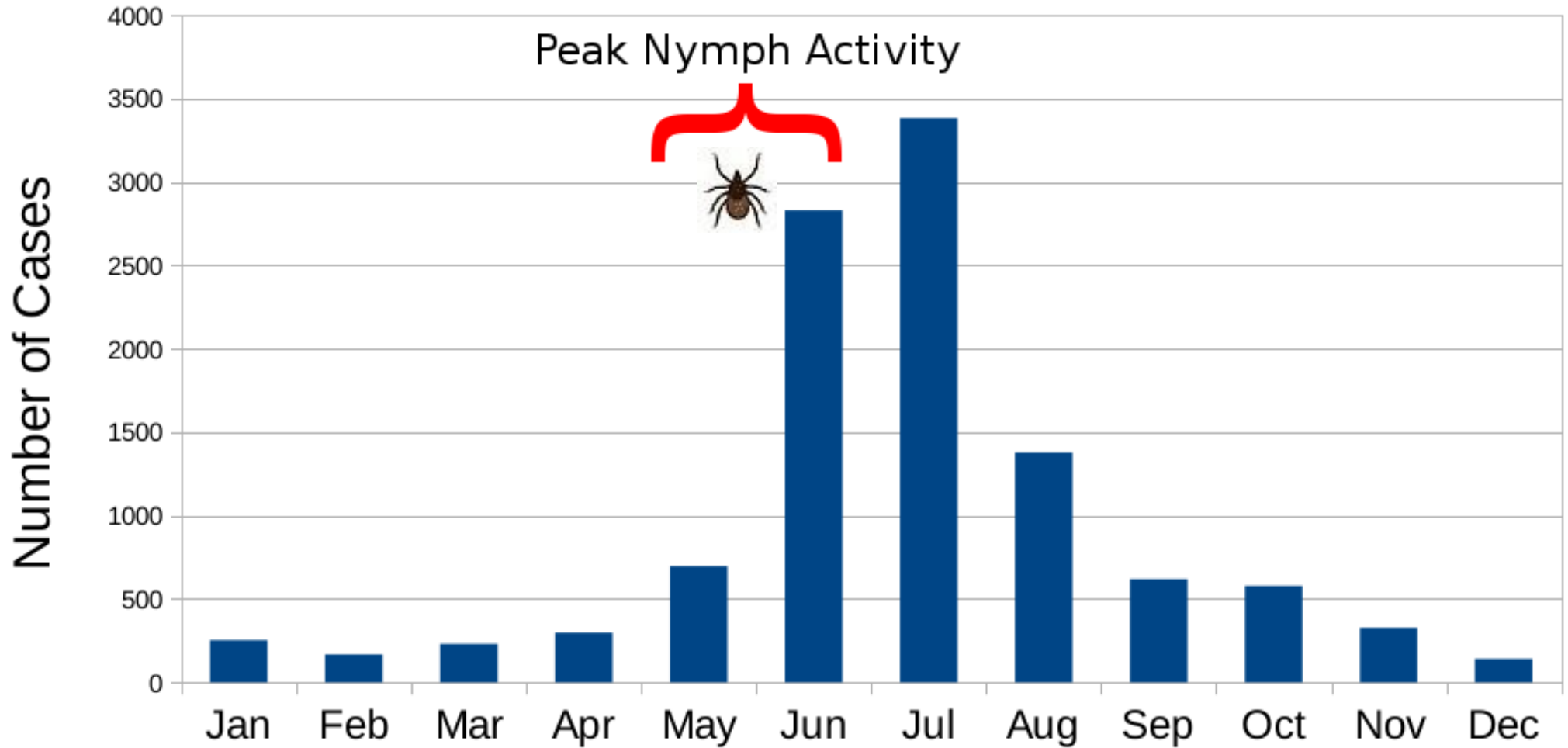
Deer Tick *Ixodes scapularis*, Adult Female Image by Scott Bauer



Deer Tick Life Cycle



Number of confirmed cases of Lyme Disease
Massachusetts, by month of onset, 2012-2014



Sunburn



Arm: © 2011 Chelsea Marie Hicks CC-BY
Foot: © 2008 theterrificc CC-BY-SA
Torso: © 2015 Paul the Cooker CC-BY

Human Hazards

- Armed subject (hunter, despondent)
 - Volunteer SAR resources generally will not respond for searches for fugitives.
- Clandestine Drug Operation
- Hunters, Poachers
- Wells
- Mineshafts, Quarries
- Abandoned Buildings
- Domestic and Farm Animals



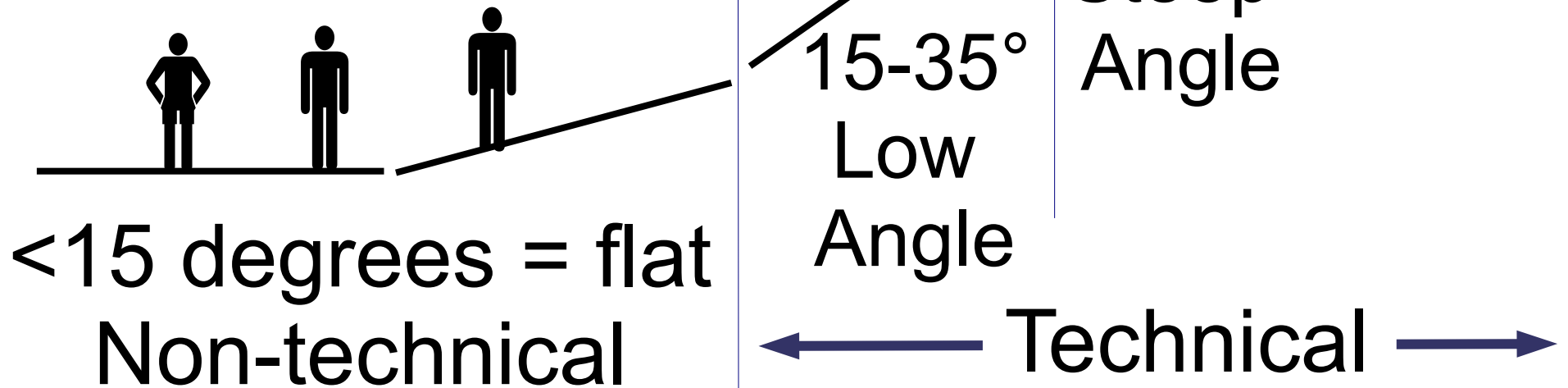
Wild Animals





ASTM F2751-16:

“Non-technical terrain: minimal slopes and little variation in elevation, where a person is able to move safely and effectively on two feet, without handholds, and without the need for a belay.”



Technical Rescue Environments

- Technical Rescue resources may be needed in any phase of the search:
 - Locate
 - Access
 - Stabilize
 - Transport

Technical Rescue Environments

- Vertical Environment
- Confined Space
- Trench
- Structural Collapse
- Water (Still Water and Swift Water)
- Ice



Water

- Drowning
- Hypothermia
- Currents
- Contaminated water
- Unsafe shorelines
- Electrocution
- Confined spaces
- Low head dams, strainers.

Low Head Dam



Strainer



Confined Space

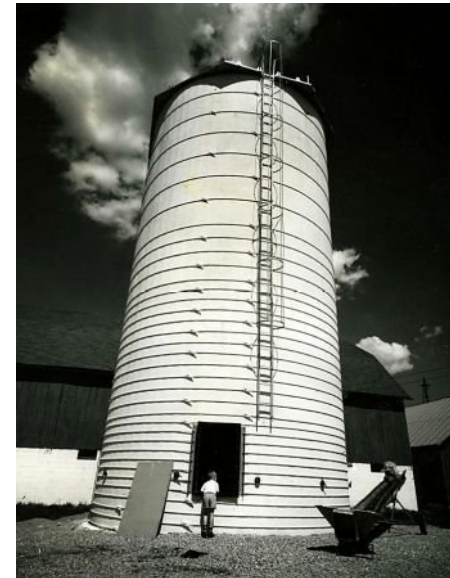
- Large enough and configured so that a person can enter and perform assigned work
- Limited or restricted means for entry and exit
- Not designed for continuous occupation.

Permit Confined Space

- Large enough and configured so that a person can enter and perform assigned work
- Limited or restricted means for entry and exit
- Not designed for continuous occupation.
- One of:
 - Contains or may contain a hazardous atmosphere
 - Contains material that may engulf a person
 - Internal configuration that could trap or asphyxiate a person
 - Contains any recognized serious safety hazard

Example confined spaces likely to be encountered in inland SAR

- Silos
- Sewers/Manholes
- Septic Tanks
- Underground utility vaults
- Ducts
- Pits and Ditches
- Machinery Housings



CC-BY Don O'Brien

60% of all confined space fatalities
are of would be rescuers.

Hazardous atmospheres may include

- Low oxygen levels
- Enriched oxygen levels
- Flammable gases or vapors
- Toxic gasses (Carbon Monoxide, Hydrogen Sulfide, etc...)

Stay Out

Record it:

Area Not Searched

Hazard



Structural Collapse

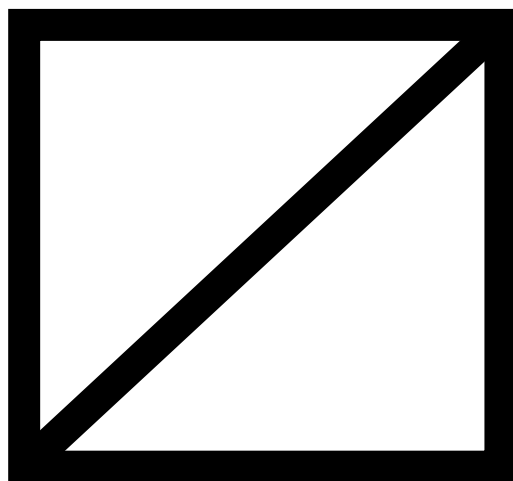
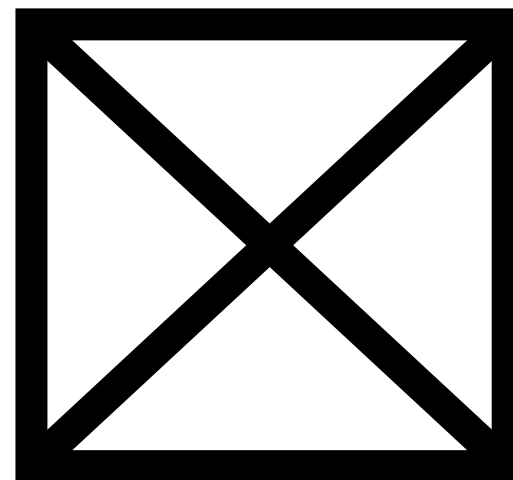
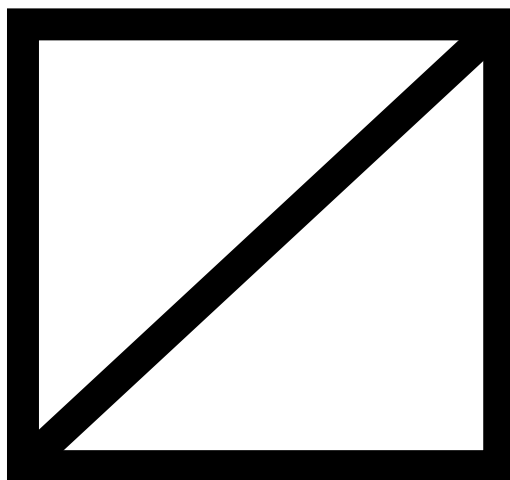
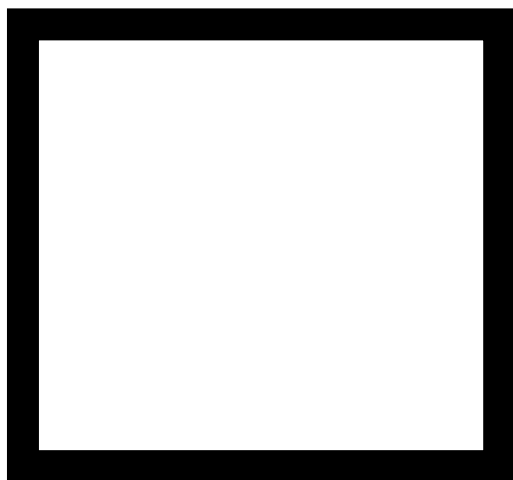




Structural Collapse

Risks in abandoned buildings and disasters

- Secondary collapse
- Toxic atmospheres
- Hazardous materials
- Risks of fire, explosion, damaged utilities, electrocution
- Collapsed floors, rotten floors, unsound floors
- Debris
- Animals
- etc...



2-10-17 1530
HM – propane
OR-TF1



Situational Awareness



Evaluate/
Monitor



Decision
Go/No Go



Ruin, Patapsco State
Park, Maryland.

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by Cyndy Sims Parr)



Risk Mitigation

- Stay out
- PPE
- Obtain properly trained and equipped help.



Weather

- Heat
- Cold
- Lightning
- Snow
- Avalanches
- Rain, floodwater





“Lightning strikes” © 2014 Attribution Some Rights Reserved John Fowler “snowpeak”



Fatigue Kills

- Nobody drives home tired.





Bloodborne Pathogens

- OSHA bloodborne pathogens training

Critical Incident Stress

- Single highly traumatic incident.
- Accumulated exposure to less traumatic incidents over time.

Sources of Critical Incident Stress

- Death of the subject
- Death of another emergency responder
- Gruesome scenes and imagery
- Prolonged incidents with fatigue, media attention, or where the subject was not found
- Search conditions: Extremes of temperature, spatial disorientation, sense of isolation
- Stress of Command

Reducing CIS and Preventing CIS from producing PTSD

- Previsualize
- Limit exposure
- Search in teams of 4 or more people
- Keep everyone oriented to the map
- Critical Incident Stress Debriefing (by trained professionals)
- Take care of each other

Hazards for SAR Canines





Hazards for SAR Canines

- Poisons
- Human foods that are toxic for canines
- Other Animals (Porcupines, Snakes, etc.)
- Paw/Limb injuries
- Heat
- Automobiles
- Tick Borne Illnesses

Mitigation

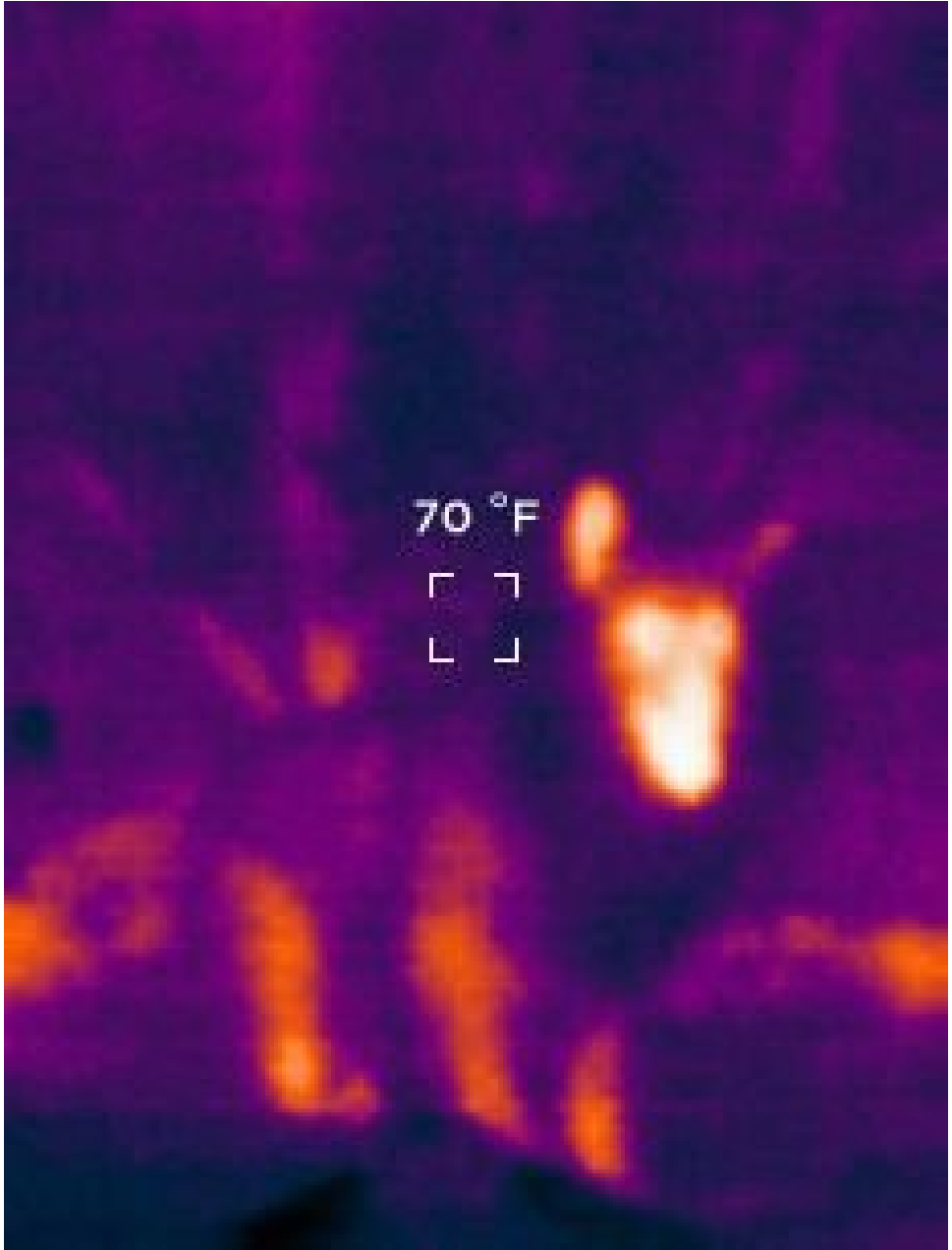
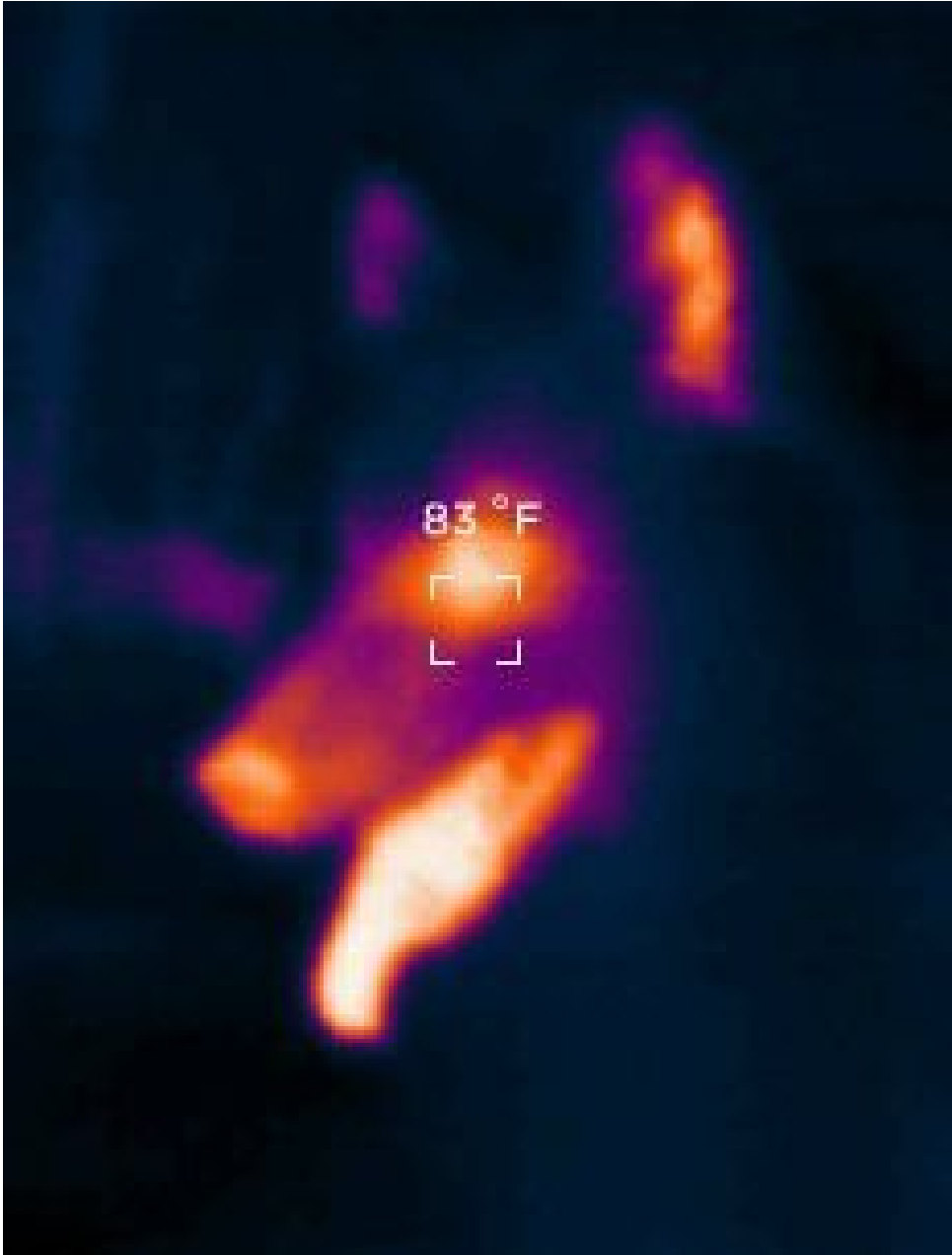
(Poisons, Automobiles, Animals)

- Train a strong “Leave it”.
- Train a strong recall.
- Train a strong “Safe”.

- Canine Medical Plan – 24 hour emergency Vets
- Canine First Aid training for all team members.

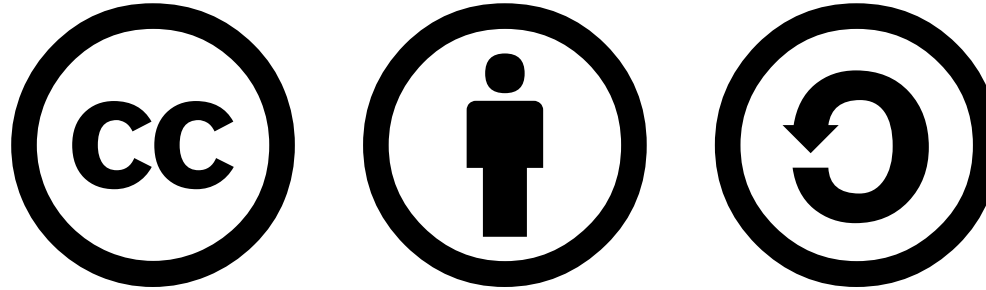
Dogs Don't Sweat





Mitigation (Heat)

- In training, keep someone at the cars with dogs that aren't in the field all the time.
- Cooling Mats, Shade Cloths.
- Provide lots of opportunities for water
- Perforated Reflective Vest



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