S-130 Unit 13: Wildland Urban Interface

Summary:

This unit is intended to introduce concepts of wildland firefighting operations in Wildland Urban Interface (WUI) areas. This unit will provide an overview of challenges, mitigation tactics, and safety procedures that impact firefighters operating in the urban interface. Information in this unit is a preface to the S-215: Fire Operations in the Wildland Urban Interface course.

Incident Position Description (IPD) Alignment:

This unit aligns with the following FFT2 IPD specific duties (https://www.nwcg.gov/positions/fft2/position-ipd):

- Conduct WUI operations according to guidelines stated in IRPG, incident-specific objectives and guidelines, and agency-specific guidance.
- Operate within your skill level and limitations.
- Report any changes in fire behavior or hazardous conditions to supervisor.

Objectives:

Students will be able to:

- Describe the characteristics of a structure during a sizeup.
- Describe Wildland Urban Interface watch out situations.
- Describe the four classifications of structure triage.
- Describe specific actions of structure protection tactics.

Unit at a Glance:

Topics	Method	Duration
Fire Behavior Predictions	Presentation	5 Minutes
Structure Sizeup	Presentation	10 Minutes
Tactical Challenges and Hazards	Presentation	20 Minutes
Structure Triage	Presentation	20 Minutes
Structure Protection Tactics	Presentation	20 Minutes
Total Unit Duration		**1 Hour, 15 Minutes**

Materials:

- *Incident Response Pocket Guide (IRPG)*, PMS 461, https://www.nwcg.gov/publications/461.
- *NWCG Glossary of Wildland Fire,* PMS 205, https://www.nwcg.gov/glossary/a-z.
- Notebook for participants.
- S-130 Student Evaluation Task Sheet.
- Ability to display images and video on large screen.
- White board or easel access for group breakout.

Slide 1


S130 Unit 13:
Wildland Urban Interface
S-130 Unit 13: Wildland Urban Interface
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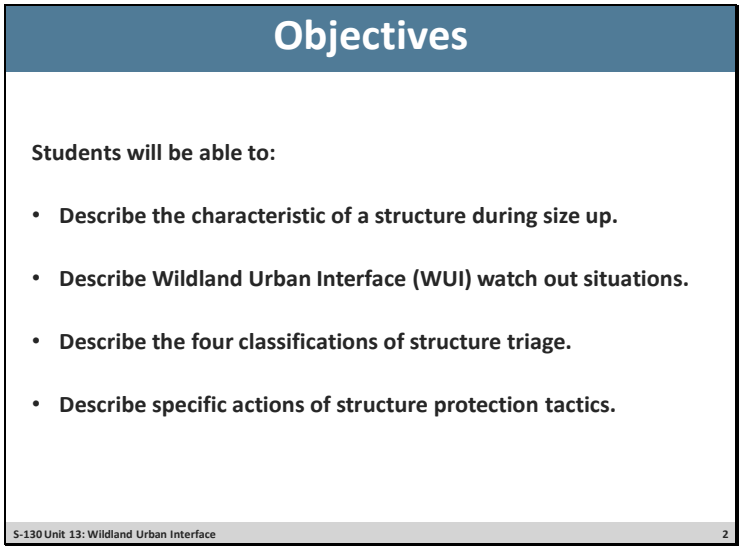
Slide 2



❑ Review unit objectives.

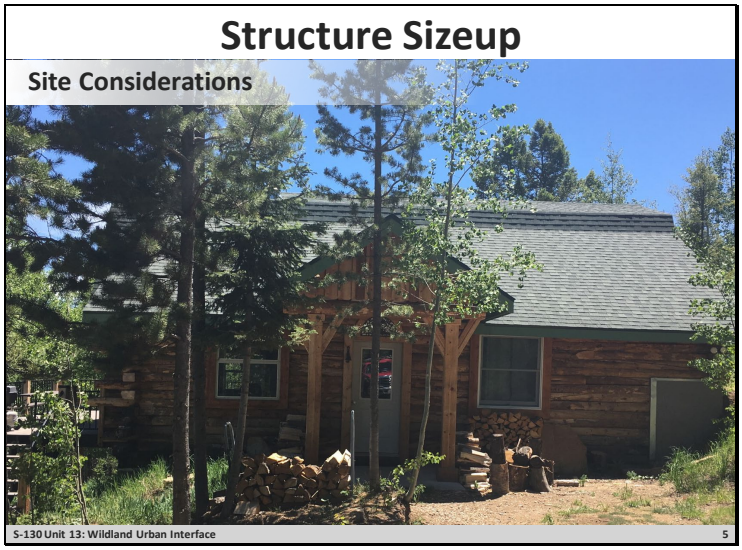
Slide 3


Wildland Urban Interface
The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetation fuels.
S-130 Unit 13: Wildland Urban Interface
3

Slide 4

- ❑ Reference the Fire Behavior Prediction section of Wildland Urban Interface Firefighting in the *Incident Response Pocket Guide (IRPG)*, PMS 461, https://www.nwcg.gov/publications/461.
- ❑ Discuss the purpose for basing all actions on the current and expected fire behavior:
  - Rate of spread and the amount of time needed to complete mitigation actions and develop a structure suppression plan.
  - Determine time needed to identify adequate safety zones and escape routes before fire arrives.
  - Identify the amount and type of resources needed to implement a plan.
  - Provide for time to familiarize with hazards and actions needed to develop a detailed sizeup.
- ❑ Discuss identifying adequate safety zones and escape timing:
  - Begin this process well ahead of the fires arrival.
  - Account for all resources on scene.
  - Evaluate if escape times are appropriate.
- ❑ Discuss the importance of contingency planning:
  - Fire is a dynamic environment and can change at any moment.
  - Plan ahead to be prepared for possible yet unexpected situations.

Slide 5



- ❑ Discuss the need for adequate safety zones based on fire behavior predictions in a WUI situation.
  - Safety zone must be calculated to fit personnel and equipment.
  - Reference Safety Zones in the *Incident Response Pocket Guide (IRPG)*, PMS 461, https://www.nwcg.gov/publications/461.
- ❑ Discuss having an adequate lookout and communication capability.
- ❑ Discuss identifying adequate defensible space based on surrounding wildland vegetation and their characteristics:
  - Fuel type
  - Fuel moisture
  - Fuel loading and arrangement
  - Fuels impact on both structure and roadways leading to a safety zone
  - Potential fuels that could benefit from burning out
- ❑ Discuss avoiding narrow canyon bottoms, mid-slope with fire below, and narrow ridges near chimneys and saddles:
  - Locations along a road that are poor barriers due to mid and upper slopes exposed to convective and radiant heat.
  - Winds channeled through narrow canyons can result in rapid rates of spread.
  - Increased radiant heat from one slope to another can increase spot fire probability.
  - Slopes of 30% or more in flashy fuels produce accelerated rates of spread due to increased heat transfer.
  - Spot fires can out flank resource positions.
  - Rolling materials can ignite fuels below resource locations.

- Discuss structures in these conditions produce the highest safety risk to firefighters and lowest survivability chances due to the following:
  - Risk of entrapment is extremely high,
  - Egress concerns,
  - Potential for rapid rates of spread and extreme fire behavior,
  - Lack of adequate safety zones, and
  - Terrain can cause fire to make several runs at structures from different directions.

Slide 6

- ❑ Discuss poor access and narrow roads leading to the WUI:
  - Ingress and egress.
  - Potential exists for fire vehicles to overcrowd an area making escape difficult, especially during evacuations.
  - Escape time frames increase with an inability to maneuver around other responding fire vehicles or evacuating citizens.
  - Smokey conditions increase risk by obscuring the drivers ability to see other traffic, the roads edge, and other roadside hazards.
- ❑ Discuss road conditions within the WUI:
  - Roads with single point of entry and exit as well as dead end or cul-de-sacs.
  - Less than 16 feet wide.
  - Have a road grade between 10-20%.
  - Heavy traffic can deteriorate roads causing washouts, washboards, and potholes which would result in delayed escape times.
- ❑ Discuss traffic mitigation measures:
  - Using common communication, control traffic at each end to secure the access.
  - Law enforcement or road departments can usually be a great resource to aid in traffic control.
  - Pre-identify roads of concern to incoming resources.
  - Pre-identify, mark, and communicate specific turn-outs, drive ways, and wide spots.

Slide 7

- ❑ Discuss unknown bridges and culvert limits in the WUI:
  - Attention must be paid to posted bridges and culverts.
  - Exceeding bridge limits could lead to failure, cutting off escape routes and restricting ingress and egress.
  - Bridge or culvert failures could result in personnel or vehicle damage and injury.
  - In unfamiliar areas, when in doubt, don't cross.
  - Bridges constructed of wood may be weakened by environmental conditions, age, or fire.
  - Bridge may not be wide enough for equipment.

Slide 8

- ❑ Discuss limited or inadequate water sources within the WUI:
  - Engines should maintain a reserve supply (generally around 100 gallons) in case of entrapment.
  - Identify alternate water sources and travel time between re-fills.
  - Identify how many resources can use a water source without depleting its return rate.
  - Prepare for the possibility of hydrant failure.
  - Adjust the volume of water use and use consciously.
  - Refill as often as possible.

Slide 9

Discuss vegetation and combustible debris within 30 feet of structure in the WUI:

- Structures on slopes of 30% or more require greater clearance around the structure.
- Maintain awareness of structures located on canyon slopes or chimneys on steep slopes with continuous, flashy fuels where fire can spread rapidly.
- Always position engines and/or vehicles facing out the driveway for easy egress.
- Maintain awareness of highly flammable firewood stacked next to structures and pre-treat firewood with foam if possible and time allows.

Slide 10

- ❑ Discuss that homes and other structures are considered a fuel that affects fire behavior:
  - Radiant heat from buildings within 30 feet of one another can cause ignition of adjacent structures.
  - A wildfire that burns and spots into a limited proximity housing development can cause an ignition chain.
- ❑ Discuss wooden siding and wooden roof material in the WUI:
  - Easy for firebrands to ignite structure
  - Radiant heat from fuels burning adjacent can ignite structure
  - Material has not been treated with flame-resistant compounds
- ❑ Discuss the main sources of ignition for structures
  - Firebrand/Ember (the primary source for structure ignition)
  - No Defensible space
  - Fuel loading on or near a structure
  - Flammable liquids and gasses
  - Age and neglect of a structure and its surroundings.

Slide 11

❑ Discuss open vents, eaves, decks, and other ember traps in the WUI:

- Easy access points for fire to enter the structure.
- Locations such as these need to be checked for smoldering or flames.
- Remove any combustible material from exposed decks and porches by placing them inside the structure or a safe distance away.

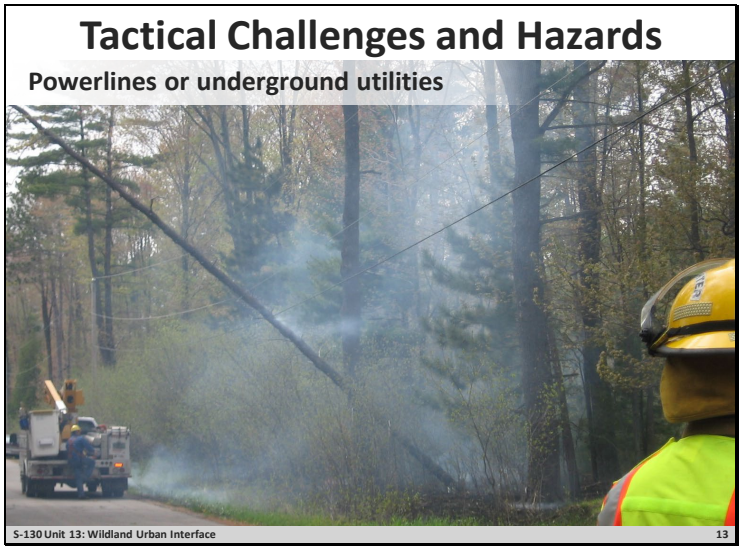
Slide 12

❑ Discuss the hazards of fuel tanks:
- Propane and other fuel tanks in close proximity to structure and other vegetation poses a threat.
- 30 feet clearance of fuels around the fuel tank must be achieved, time permitting.
- Check other surrounding sheds and structures for storage of fuel.

❑ Discuss other hazards that could be contained in homes and other structures:
- Paint
- Flammable cleaning materials
- Pesticides
- Gas cans
- Ammunition and explosives
- Plastics and synthetic materials
- Vehicles

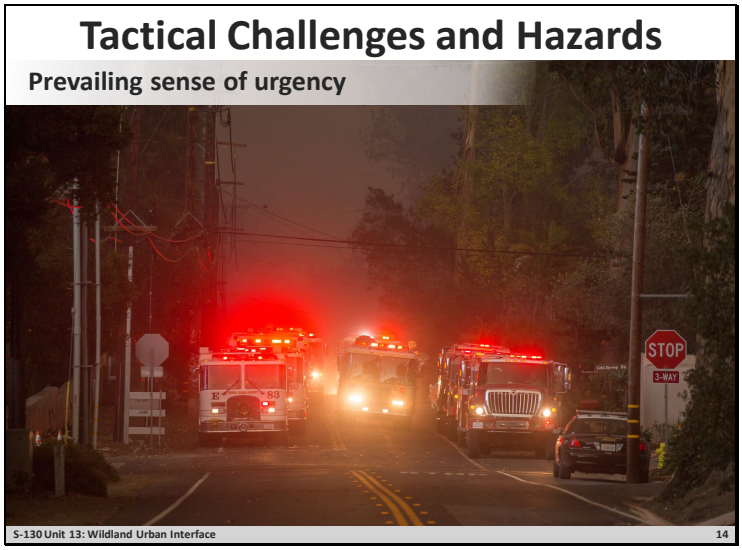
❑ Meth labs and other drug related sites:
- Can be common in rural areas
- Identify, mark, and communicate the presence of suspicious buildings or receptacles
- Post lookouts
- Keep supervisor informed of hazards
- Stay upwind and do not approach until structure has been cleared by hazmat

Slide 13



- ❑ Reference Powerline Safety in the *Incident Response Pocket Guide (IRPG)*, PMS 461, https://www.nwcg.gov/publications/461.
- ❑ Discuss powerlines or underground utilities in the WUI.

Slide 14



- ❑ Describe and discuss the effects of a prevailing sense of urgency within the WUI:
  - Effect on situational awareness.
  - Ability to make decisions.
  - Willingness to accept increased risk.
  - Effect on communication and span of control.
  - Effect on risk management.

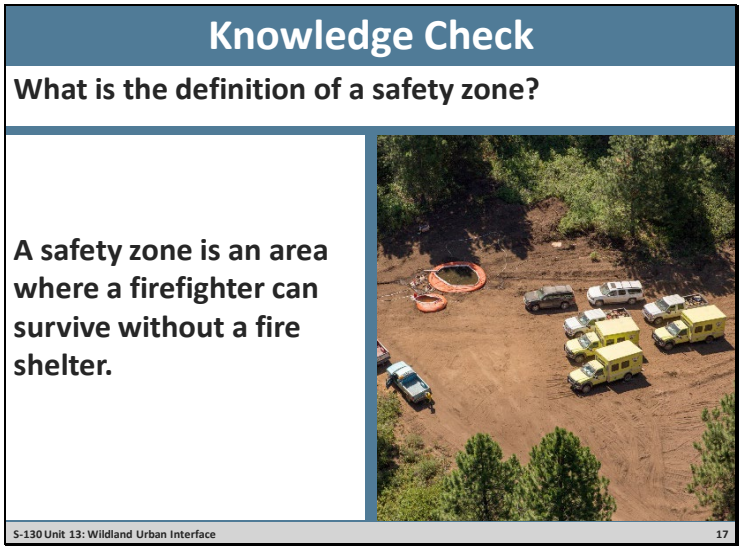
Slide 15

- ❑ Discuss property owners remaining on-site:
  - Residents cannot be forced to evacuate despite how dangerous the situation may be.
  - Could potentially create more risk by attempting to aid in suppression efforts without proper communication and tactical knowledge.
- ❑ Discuss important considerations around evacuations of the public (people, pets, within the WUI:
  - Law enforcement and rural fire districts will normally handle evacuation execution.
  - The Incident Management Teams advise on the need to evacuate and will hold briefings about the fire's situation and evacuation for general public.
  - The variable nature of fire behavior means leaving the area early is the best way to guarantee personal safety.
  - Allow fire personnel to focus on fire operations and personal safety.
  - Evacuations during initial attack can come with little warning or time, creating panic, and confusion.
  - During extended attack implement contingency and evacuation plans well ahead of time.
  - The need to evacuate livestock, pets, and other animals can add additional complications to the evacuation process.
  - Law enforcement are a crucial presence during evacuations and are equipped with communication but lack the training and Personal Protective Equipment (PPE) for their safety and may need to evacuate the area.

Slide 16

- Discuss the potential effects of smoke byproducts often laced with chemical compounds not found in pure wildland fires:
  - Burning rubber
  - Plastics
  - Metals
  - Paints, varnishes, and other chemicals

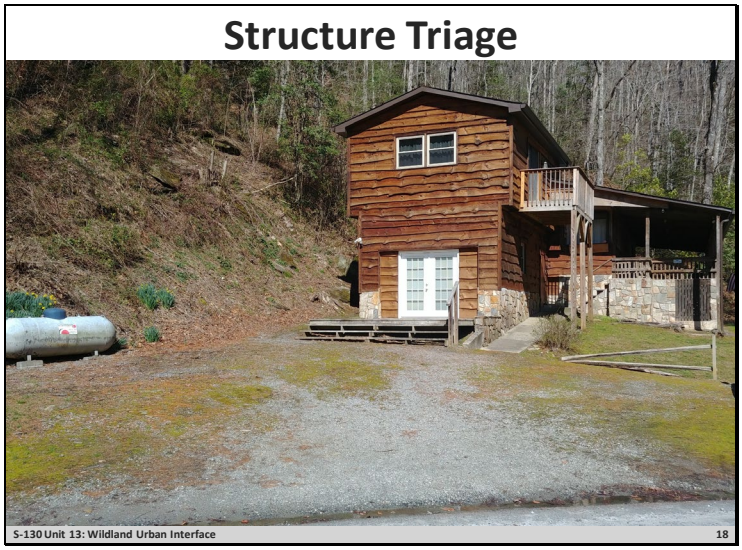
Slide 17



Question: What is the definition of a safety zone?

Answer: A safety zone is an area where a firefighter can survive without a fire shelter.

Slide 18



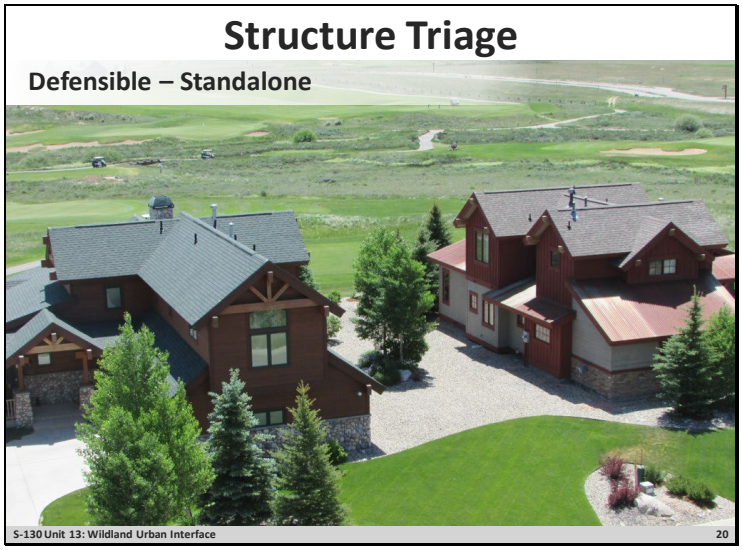
- ❑ Discuss structure triage as a systematic method of evaluating individual structures within an urban area for the ability to withstand a potential flame front passage.
- ❑ Reference Structure Triage in the *Incident Response Pocket Guide (IRPG)*, PMS 461, https://www.nwcg.gov/publications/461.
- ❑ Identify the four primary categories of structure triage:
    - Defensible – prep and hold
    - Defensible – stand alone
    - Non-defensible – prep and leave
    - Non-defensible – rescue drive-by
- ❑ Discuss defensible space:
    - An area around a structure in which vegetation, debris, and other types of combustible fuels have been treated, cleared, or reduced to slow the spread of fire and reduce the impact on a structure.

Note to Instructor
Slides 19 – 22 provide for further discussion of the four primary categories of structure triage.

Slide 19

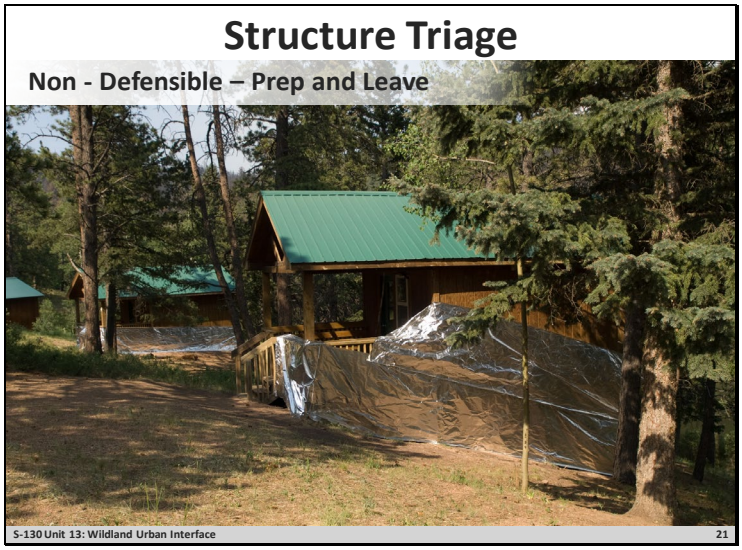
- ❑ Discuss the triage category prep and hold.
- ❑ Discuss the three factors that determine why this structure is defensible – prep and hold:
  - Determining factor
  - Sizeup
  - Tactics

Slide 20



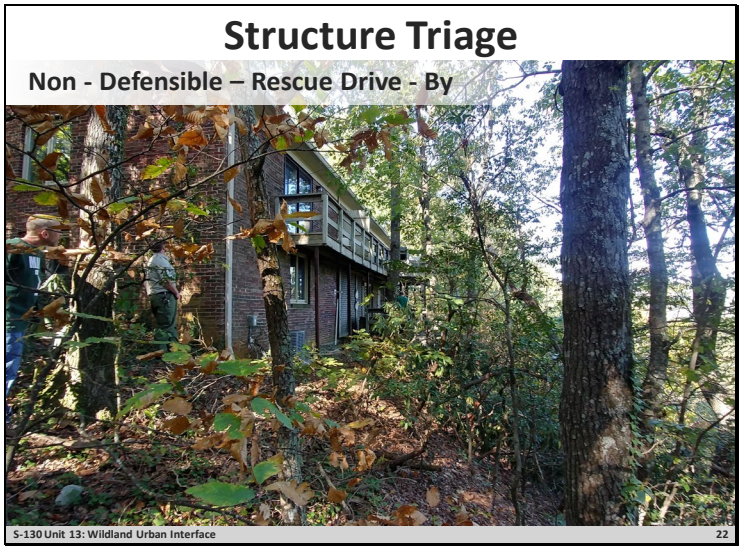
- ❑ Discuss the triage category defensible – standalone.
- ❑ Discuss the three factors that determine why this structure is defensible – standalone:
  - Determining factor
  - Sizeup
  - Tactics

Slide 21



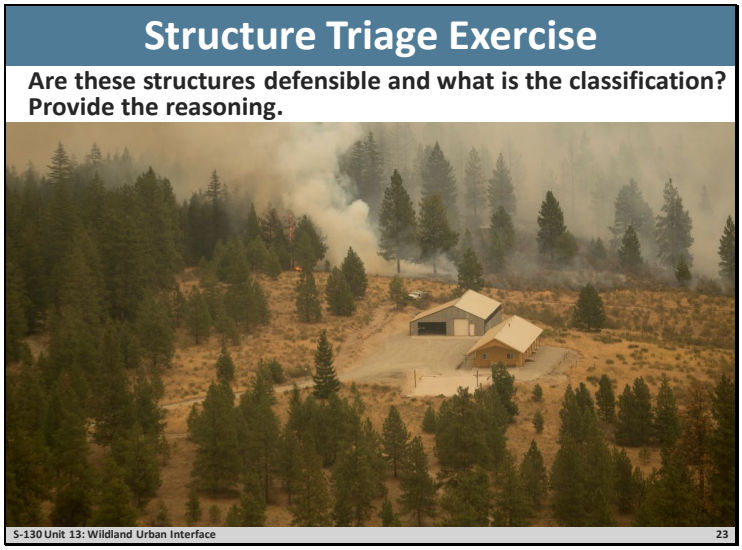
- ❑ Discuss the triage category non-defensible – prep and leave.
- ❑ Discuss the three factors that determine why this structure is non-defensible – prep and leave:
  - Determining factor
  - Sizeup
  - Tactics

Slide 22



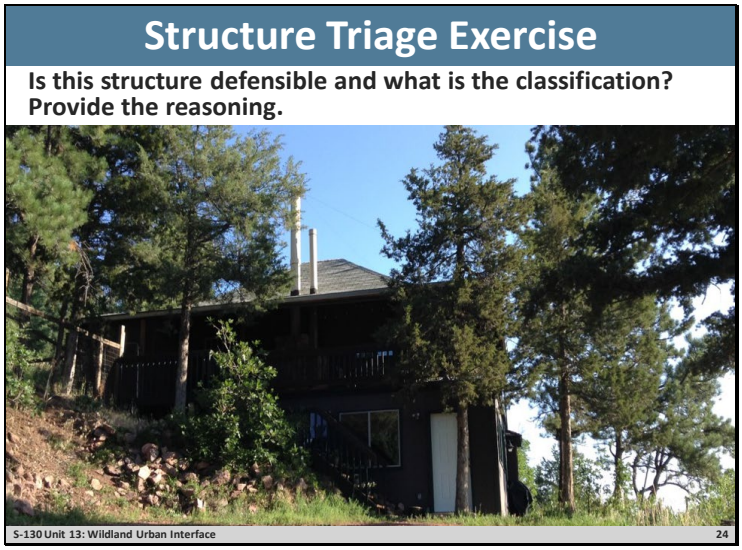
- ❑ Discuss the triage category non-defensible – rescue drive-by.
- ❑ Discuss the three factors that determine why this structure is non-defensible – rescue drive-by:
  - Determining factor
  - Sizeup
  - Tactics

Slide 23



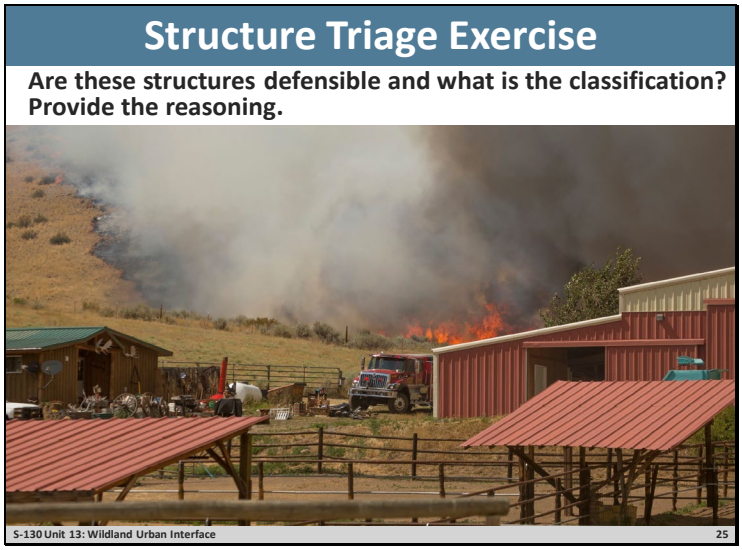
- ❑ Direct the students to identify if the structures in the image are defensible or not, which category, and their reasoning.
  - No right or wrong answers. This is only meant for discussion purposes.
  - This slide is meant to identify defensible-standalone.

Slide 24



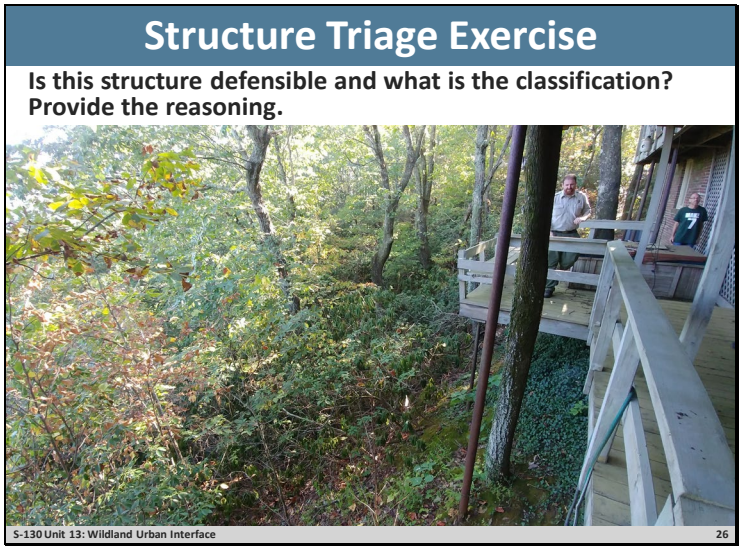
- ❑ Direct the students to identify if the structure in the image is defensible or not, which category, and their reasoning.
  - No right or wrong answers. This is only meant for discussion purposes.
  - This slide is meant to represent non-defensible – prep and leave.

Slide 25



- ❑ Direct the students to identify if the structures in the image are defensible or not, which category, and their reasoning.
  - No right or wrong answers. This is only meant for discussion purposes.
  - This slide is meant to represent defensible – prep and hold.

Slide 26

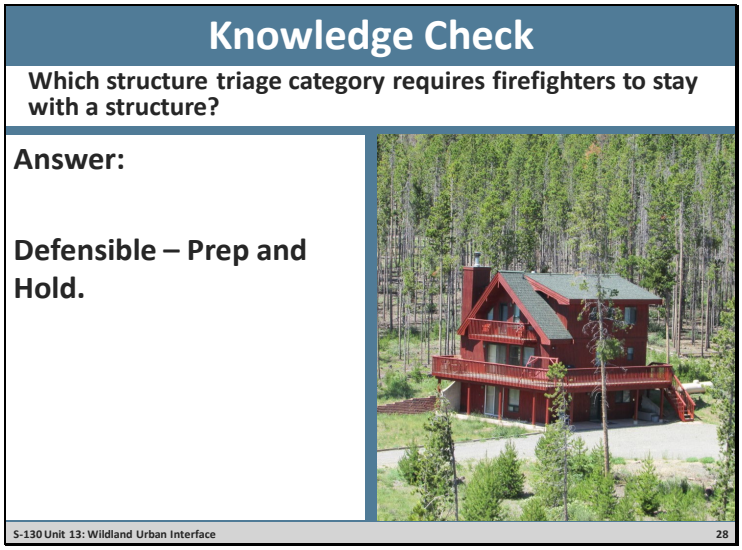


- ❑ Direct the students to identify if the structure in the image is defensible or not, which category, and their reasoning.
  - No right or wrong answers. This is only meant for discussion purposes.
  - This slide is meant to represent non-defensible – rescue drive-by.

Slide 27

- ❑ Reference Structure Protection Tactics in the *Incident Response Pocket Guide (IRPG)*, PMS 461, https://www.nwcg.gov/publications/461.
- ❑ Discuss rapid mitigation measures in addition to content in the IRPG:
    - Remove flammable materials from the following:
        - Roof and gutter
        - On and underneath decks
        - Combustible fencing that may be attached to the home
        - To at least five feet away from a structure
- ❑ Discuss equipment and water use:
    - Have vehicles staged nearby for quick response.
    - Charge water systems such as pumps, hose lays, sprinklers, and fill portable tanks and pools.
- ❑ Discuss the importance of patrols following the fire front passage and as soon as it is safe:
    - Identify new potential dangers:
        - Possibility for embers to increase fire activity
        - Snags
        - Potential for structures to be involved
        - Hazmat
        - Hot spots will exist even after the fire has subsided
    - Re-evaluate a possible need for additional resources (type and amount) for structure protection.
    - Identify opportunities to engage in suppression and mop up to limit exposure to adjacent structures.
- ❑ Discuss that a FFT2 will be tasked with mop up in the WUI with little knowledge of structure protection activities.

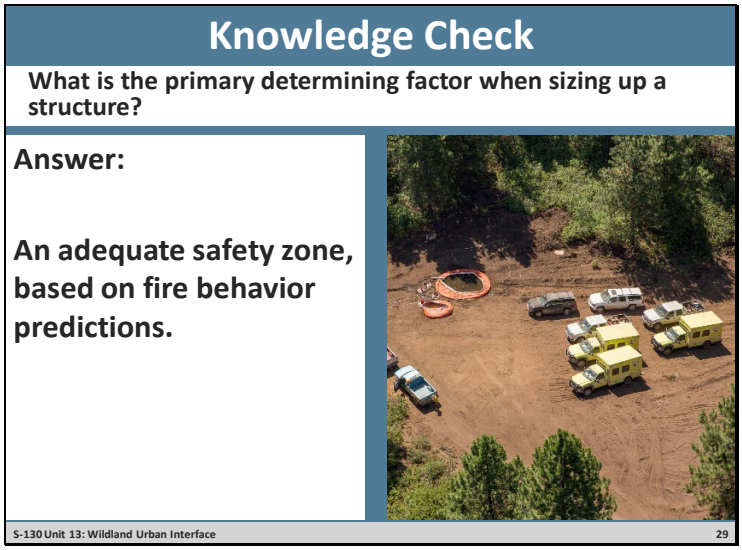
Slide 28



Question: Which structure triage classification requires firefighters to stay with a structure?

Answer: Defensible – Prep and Hold

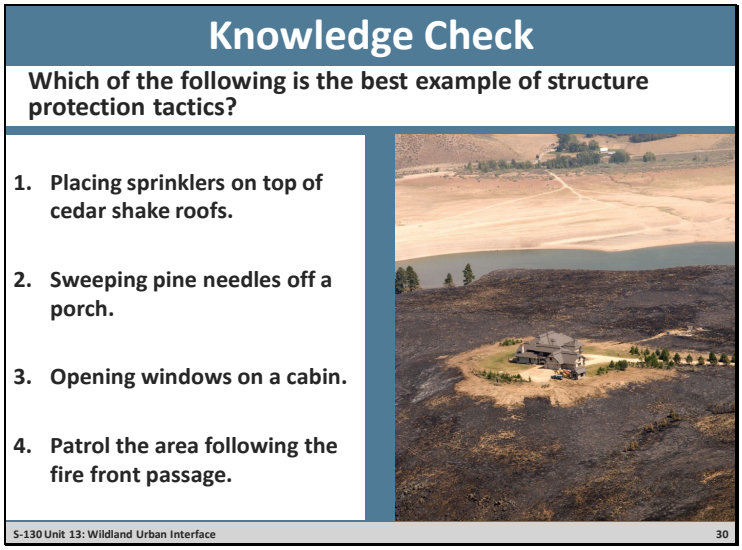
Slide 29



Question: What is the primary determining factor when sizing up a structure?

Answer: An adequate safety zone, based on fire behavior predictions.

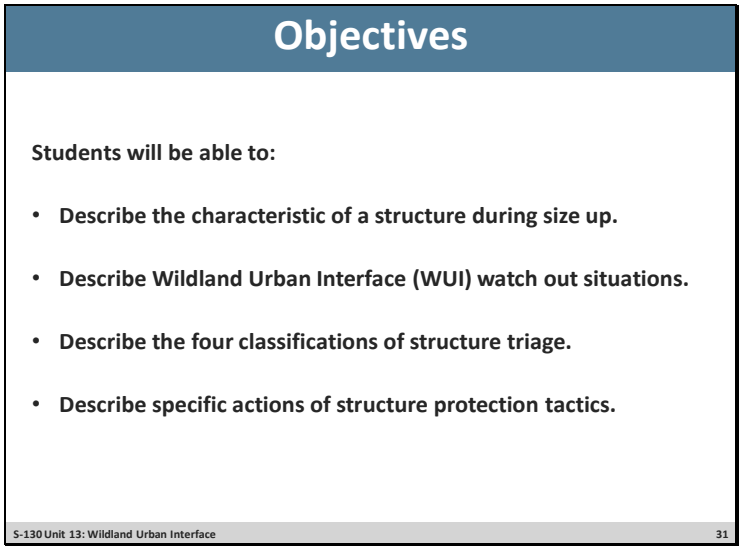
Slide 30



Question: Which of the following is the best example of structure protection tactics?

Answer: 4. Patrol the area following the fire front passage.

Slide 31



❑ Review unit objectives.