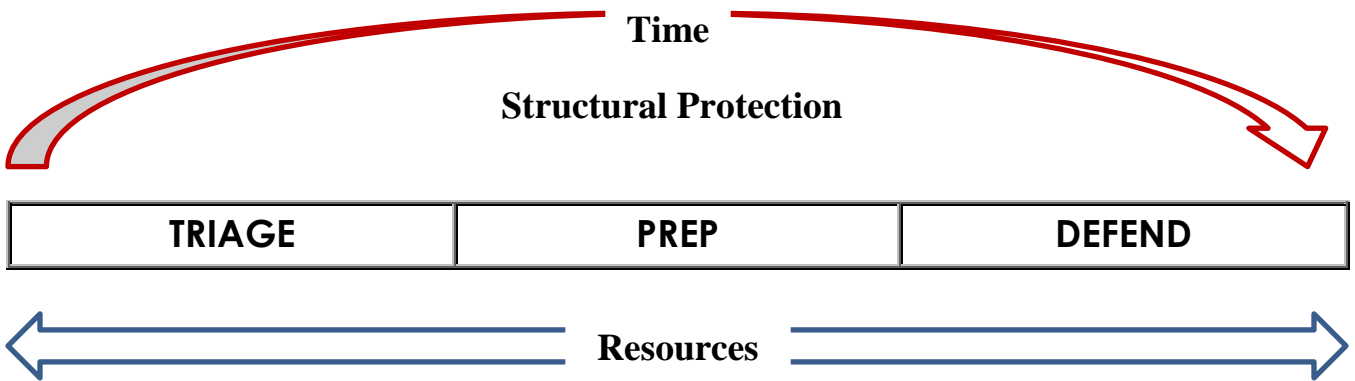


# WILDLAND – STRUCTURAL PROTECTION



**PURPOSE**

This structural protection plan is designed to provide structural resources with common expectations, procedures and terminology in order to execute efficient structural protection during wildland fire/urban interface incidents.

**PROCEDURE**

The components of effective structural protection are based on the integrated actions surrounding three critical actions; Structural Triage, Structural Preparation and Defensible Tactical Action. The successful implementation of these actions is based on the following critical factors: TIME, RESOURCES, and FIRE CONDITION. These factors must be strongly considered in the decision making of when and how to execute the critical structure protection actions.

**I. Structural Triage**

Utilization of the OSFM Structural Protection Checklist should be utilized when triaging structures with the goal of placing each structure in one of the following categories. These categories will be utilized to determine the structural prep and defensible actions given consideration of available time, resources, and fire condition.  
See the table on Page 2 for categories and conditions.

# WILDLAND – STRUCTURAL PROTECTION

## I. Structural Triage Continued...

<p><b>Defensible – Stand Alone (Low Risk)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Safety zone present</li> <li><input type="checkbox"/> Requires little or no attention</li> <li><input type="checkbox"/> Will require patrol or homeowner presence after fire passage</li> </ul>	<p><b>Non-Defensible – Prep and Go (High Risk)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No safety zone present</li> <li><input type="checkbox"/> If time allows, rapid mitigation, apply foam or gel</li> <li><input type="checkbox"/> Set trigger point for safe retreat</li> <li><input type="checkbox"/> Go to nearest safety zone, return to area after fire passage</li> </ul>
<p><b>Defensible – Prep and Defend (Moderate Risk)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Safety zone present at or near structure for apparatus and firefighters</li> <li><input type="checkbox"/> Structure has a higher probability of ignition without firefighter intervention</li> </ul>	<p><b>Non-Defensible – Check and Go (Extreme Risk)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No safety zone present</li> <li><input type="checkbox"/> Inadequate time for mitigations</li> <li><input type="checkbox"/> If time allows, ensure lives are not threatened</li> <li><input type="checkbox"/> Set trigger point for safe retreat</li> <li><input type="checkbox"/> Go to nearest safety zone, return to area after fire passage</li> </ul>

## I. Structure Preparation

Structural preparation is executed based on the Structural Protection Checklist and is a factor of TIME, RESOURCES, and FIRE CONDITION. If a fire front is imminent or highly likely the goal is to defend what can be saved and accomplish as much of the Structure Prep Priorities as feasibly possible. This section is intended to provide structural protection resources with a clear guideline of what structure prep objectives are expected based on the mode of operation. This is a critical component of the structure prep plan, if there are other actions not addressed in this plan it is recommended that those actions are discussed with the appropriate supervisors. Prioritize Structural Prep Actions based on the greatest chance of savability. Complete prep actions on the structures using the following order.

1. **Low Risk- Stand Alone.** Reinforce and ensure prepped for standalone defense.
2. **Moderate Risk- Prep and Hold.** Time sensitive, these structures provide biggest gains.
3. **High Risk- Prep and Go.** Time sensitive.
4. **Extreme Risk- Check and Go**

# WILDLAND – STRUCTURAL PROTECTION

## Structure Prep Priorities

The following outlines the order of priority in which preparation should be conducted. Two general levels of structure prep are identified: Surface Prep and Full Prep. The three critical factors of time, resources, and fire condition will determine which level and priority should be accomplished. This determination may occur in conjunction with the Division/Group Supervisor. Depending upon these critical factors, attempt to accomplish as much as feasibly possible starting with Surface Prep priorities down through the Full Prep priorities. **The ultimate goal with any of the following prep work is to minimize or eliminate the direct flame contact to the edge of a combustible building material.**

### **SURFACE PREP**

*Should always be completed first. Allows crews to conduct initial prep work without physically altering structures or property providing crews opportunity to conduct work if fire front is not imminent and it is unclear if fire front will affect the area.*

#### **Priority #1 ROOF** (critical ignition component)

- Clean out gutters and ember traps at the vertical intersections and horizontal surfaces, remove receptive fuel beds, leaves, needles, debris and any other flammable materials on or attached to the roof.
- Flush gutters with water and plug down spouts.

#### **Priority #2 INTERIOR**

- Close windows.
- Turn lights on, close interior doors and unlock and shut exterior doors.

#### **Priority #3 EXTERIOR**

- Relocate easy to move flammable/combustible items surrounding structure (lawn furniture, toys, propane cylinders, gas cans etc.) to an area of cover or outside preparation perimeter (garage, shed, barn etc.).
- Clear decks, walkways and other areas of light receptive fuels (leaves, needles etc.). Consider base of exterior walls, decks or other areas of adjoining combustible surfaces of the structure.

# WILDLAND – STRUCTURAL PROTECTION

## FULL PREP

*Complete Surface Prep priorities first and then determine which of the following Full Prep tasks need to be/can be completed.*

### Priority #4 EXTERIOR

- Remove receptive fuels adjacent to the structure 5-10 feet (fine dead fuels, leaves, grass, bark dust, firewood, etc.).
- Cover attic and basement vents (metal window screen is preferable).
- Shut off gas, LP/NG.

### Priority #5 SECONDARY PRIORITIES

- Remove vegetation within 30 feet of structure scatter flat.
- Limb trees 5 to 7 feet from ground.
- Remove debris and ember traps around structure.
- Remove lawn furniture and toys- place in home if possible.
- Remove attached fences 10 feet from structure for access and removal of combustibles.
- Remove and scatter wood pile or cover to avoid ignition by ember shower.
- Move cars if possible.
- Construct handline around structure, outbuildings, or immovable fuel sources/hazards.
- Consider burn out operations.
- Consider use of sprinkler kits. Only if adequate structural prep has been obtained.
- Consider use of structure wrap.
- Consider extreme prep tactics (additional limbing or falling of trees).
- Consider egress preparation. Limbing/brushing 5 to 10 feet on either side of road/driveway.
- Consider the need for Temporary Refuge Area (TRA) and/or Safety Zone preparation.

## FIRE IMMINENT

*Consider when fire front is imminent and structure is categorized as defensible.*

- Determine defensible action.
- Stretch hose lines.
- Ladder roof, hose to roof.
- Initiate Structural Prep Checklist if not already complete- Complete as much as possible before initiating defensible stand.
- Consider burn out operations.

# WILDLAND – STRUCTURAL PROTECTION

## Temporary Refuge Areas:

Although Safety Zones and viable escape routes shall always be identified, they may not be immediately available should the fire behavior increase unexpectedly. Often a Temporary Refuge Area (TRA) is more accessible in the WUI environment. A TRA will provide temporary shelter and short-term relief from an approaching wildfire without the use of a fire shelter and allow the responders to develop an alternate plan to safely survive the increased fire behavior. Examples: lee side of structure, inside of structure, large lawn or parking area, cab of apparatus, burned area.

## II. Defensible Tactical Action

The following tactical actions allow firefighters combating an urban interface wildland fire to utilize common terminology and actions in order to safely and effectively defend structures.

### Primary Tactical Action

Primary tactical actions are based on the triage category and level of structure prep accomplished prior to arrival of fire front. Primary tactical action may be supplemented or transition to another primary action or secondary tactical action as needed.

#### 1. STAND ALONE

*Triage Category: Defensible (Low Risk)*

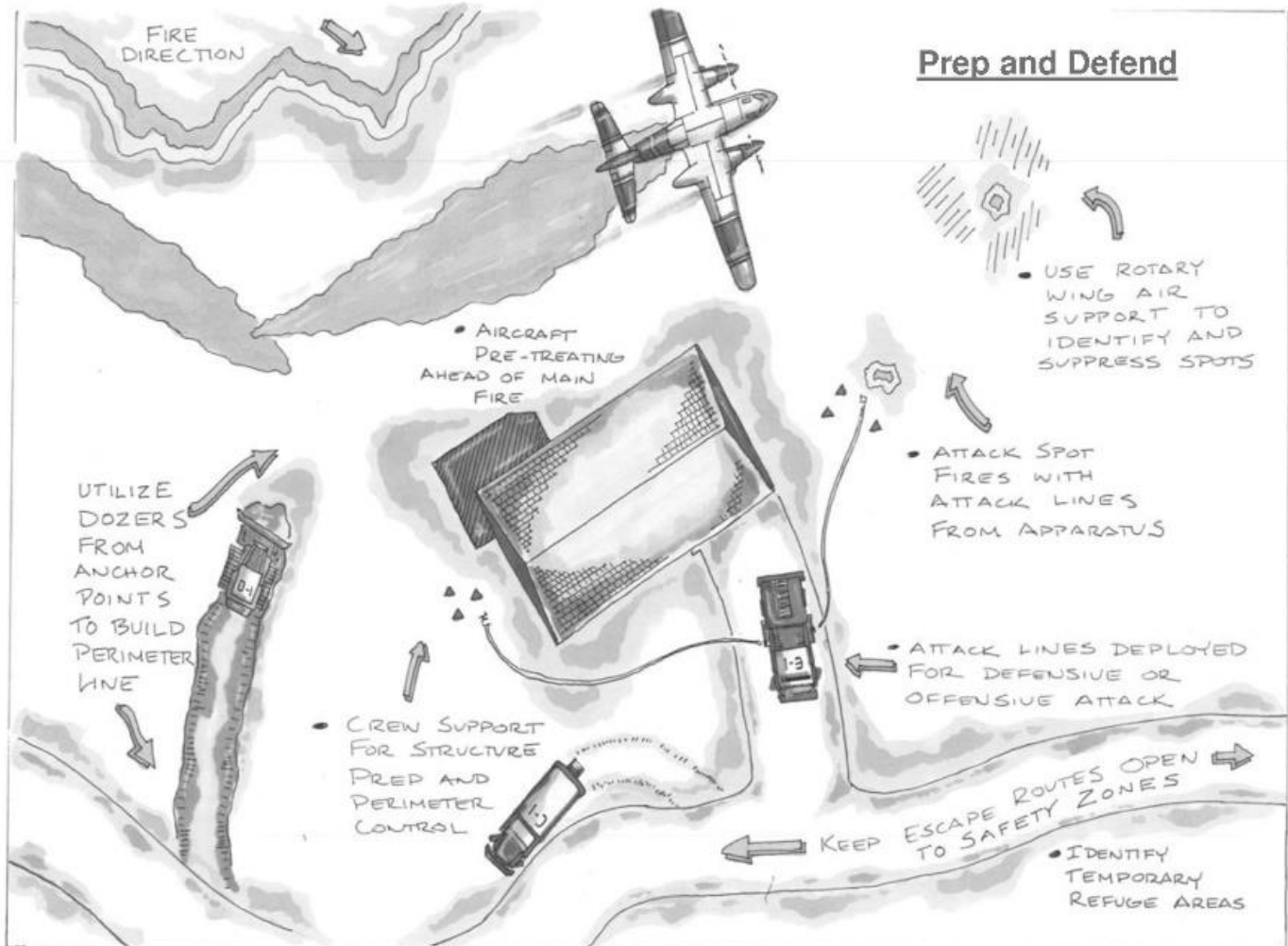
- **Purpose:** Adequate safety zones and escape routes allow for safe and effective preparation and defensible stand.
- **Indicators:** Structure requires little or no preparation or protection.
- **Actions:** Ensure adequate structural preparation measures are in place. If needed make defensible stand as fire front approaches.
- **Considerations:** Situational awareness. Tactical patrol before and after fire front. Increased possibility of occupants holding in place.

# WILDLAND – STRUCTURAL PROTECTION

## 2. PREP & DEFEND

*Triage Category: Defensible (Moderate Risk)*

- **Purpose:** A tactic used when it is possible for fire resources to stay and defend structures as the fire front arrives.
- **Indicators:** Safety zones, escape routes and TRAs are present and adequate time allows for safe preparation of structure for defense prior to fire front impact.
- **Actions:** Aggressive structure prep following Structure Prep Checklist. Adequate time, resources and conditions to make a defensible stand as fire front approaches.
- **Considerations:** Situational awareness, escape routes and safety zones must be identified and maintained. Utilization of PACE planning in case of adverse fire behavior changes. Fire behavior must allow for firefighters to safely remain in place and engage the fire.

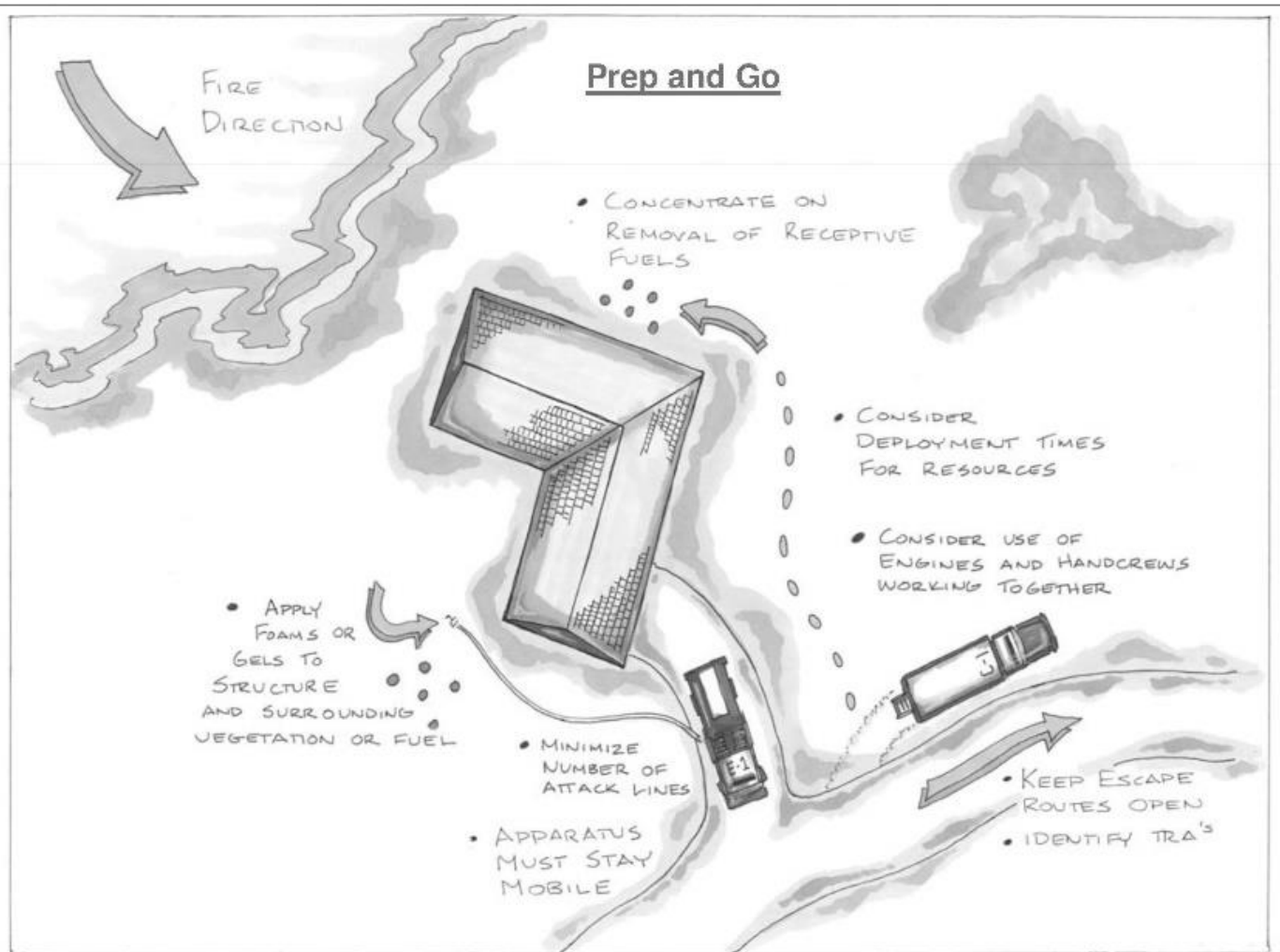


# WILDLAND – STRUCTURAL PROTECTION

## 3. PREP & GO

*Triage Category: Defensible (High Risk)*

- **Purpose:** No safety zone present.
- **Indicators:** Time allows for rapid mitigation measures.
- **Actions:** Rapid triage, prep and retreat to Safety Zone or TRA.
- **Considerations:** Set trigger point for safe retreat and return tactical action.

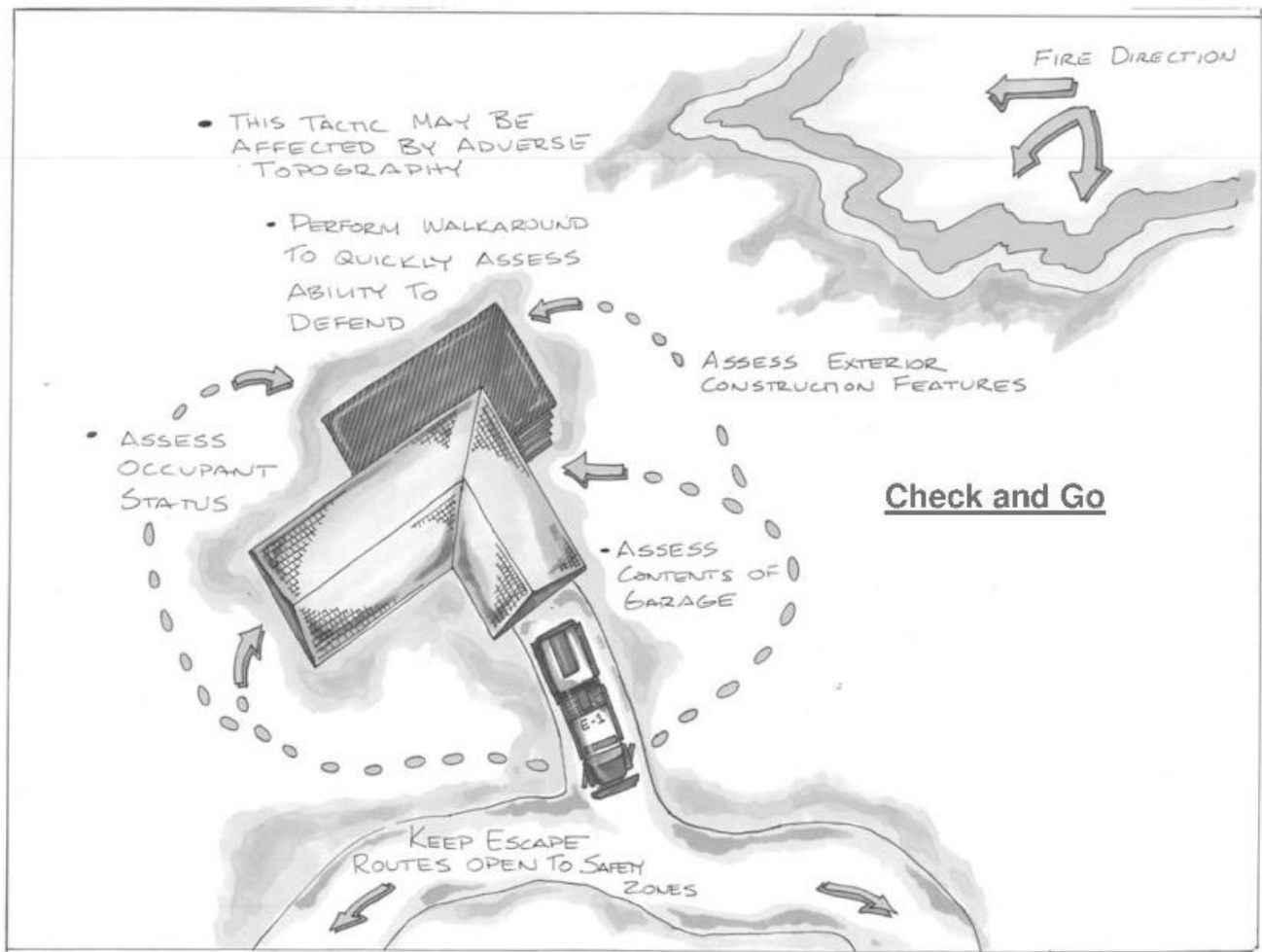


# WILDLAND – STRUCTURAL PROTECTION

## 4. CHECK & GO

*Triage Category: Non-Defensible (Extreme Risk)*

- **Purpose:** Inadequate defensible space prohibits safe defense actions.
- **Indicators:** Extreme fire behavior, compressed time constraints.
- **Actions:** Rapid evaluation to check for occupants who may require removal or rescue, then withdraw to a Safety Zone or TRA.
- **Considerations:** Retreat and return tactical action when able.





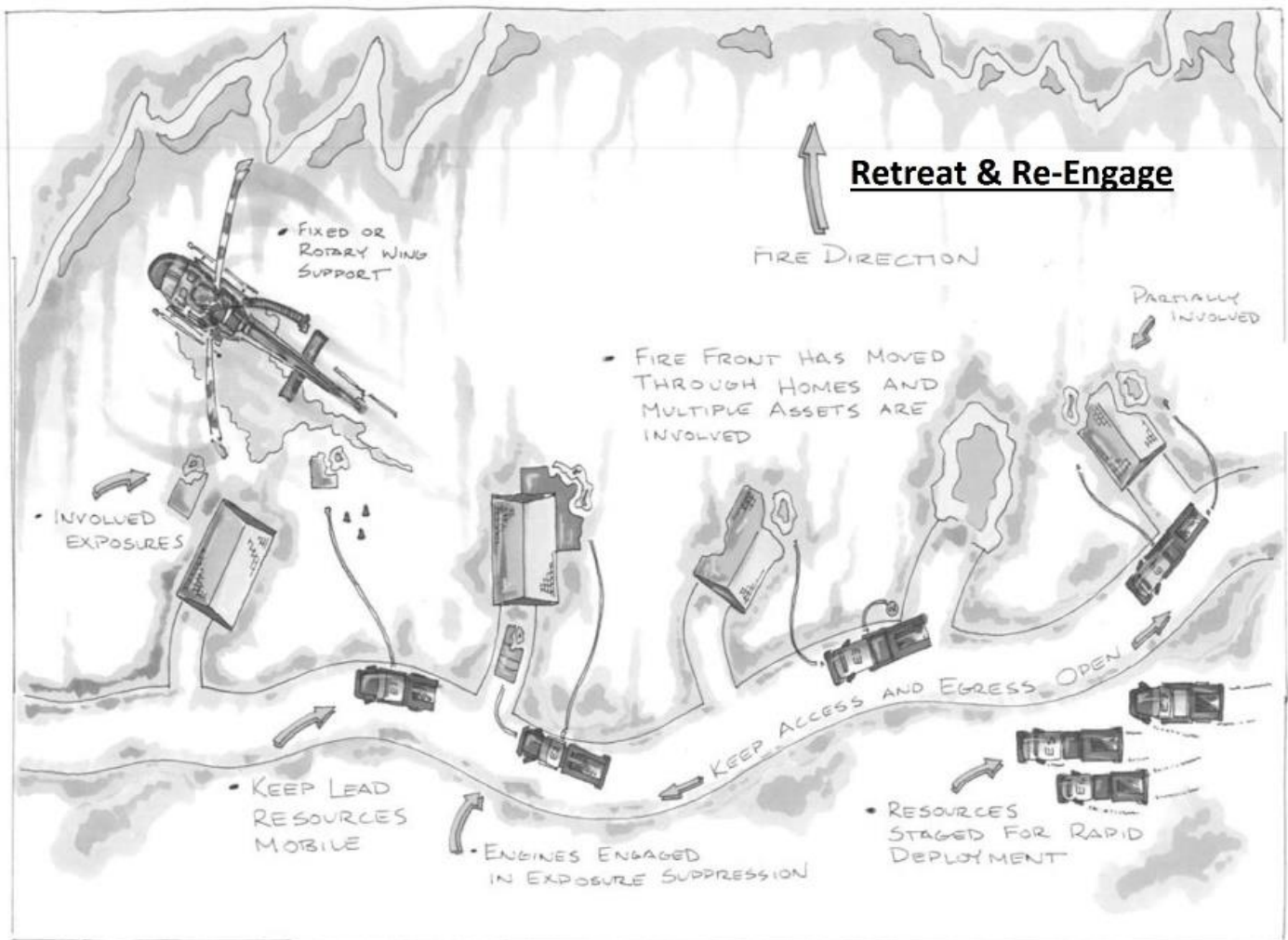
# WILDLAND – STRUCTURAL PROTECTION

## Secondary Tactical Action

Secondary tactical action should be utilized to supplement and support the primary tactical action.

### 1. RETREAT & RE-ENGAGE

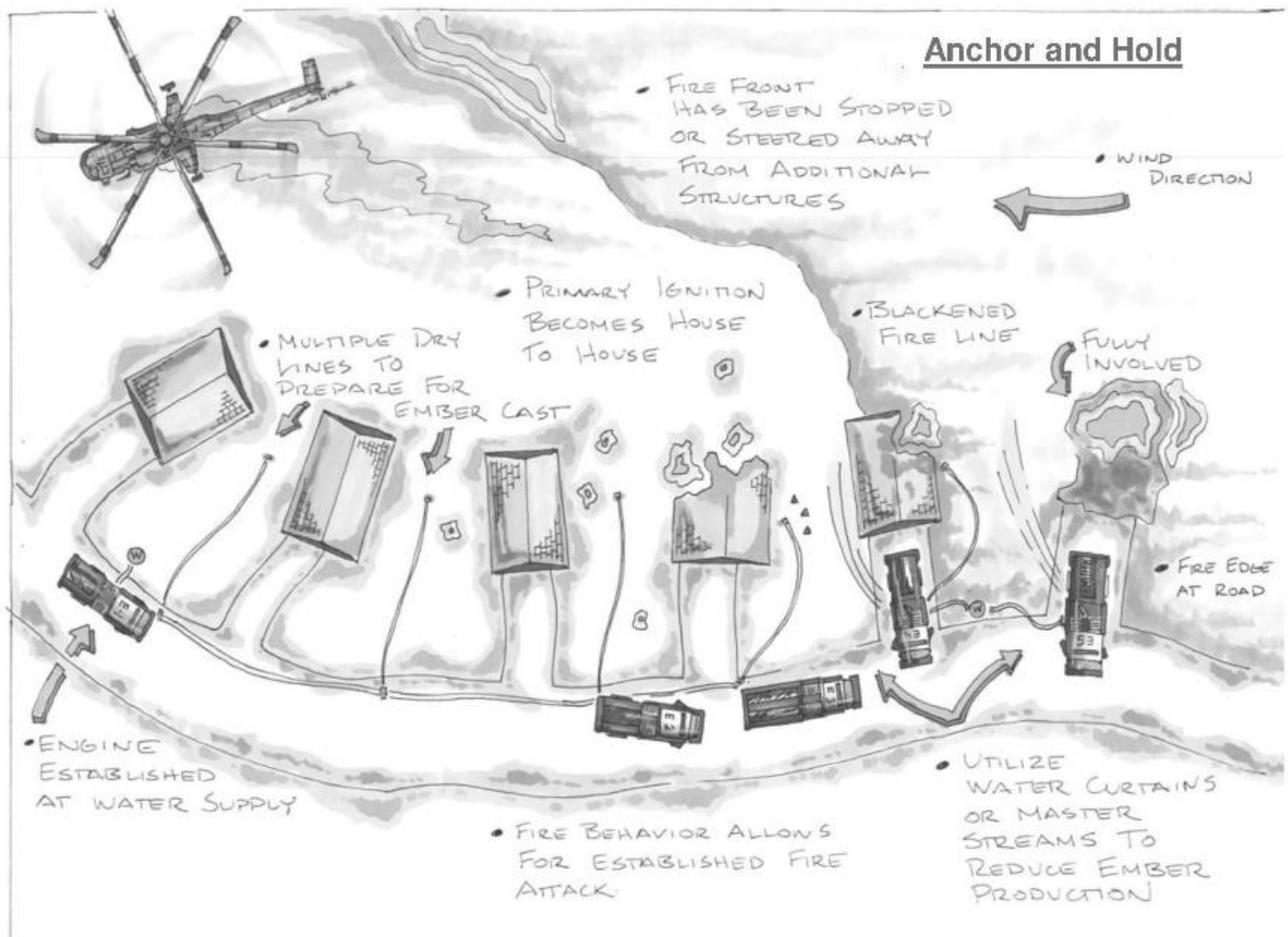
- **Purpose:** Follow up tactic used when Check and Go, Prep and Go or Bump and Run tactics are initially used.
- **Indicators:** When there is insufficient time to safely set up ahead of the fire or the intensity of the fire would likely cause injury to personnel located in front of the fire.
- **Actions:** After retreating to TRA or Safety Zone, return behind the fire front to search for victims, minimize property loss, effect perimeter control, extinguish hot spots around structures, control hot spots and reduce ember production.
- **Considerations:** Adequate TRA and/or safety zone



# WILDLAND – STRUCTURAL PROTECTION

## 2. ANCHOR & HOLD

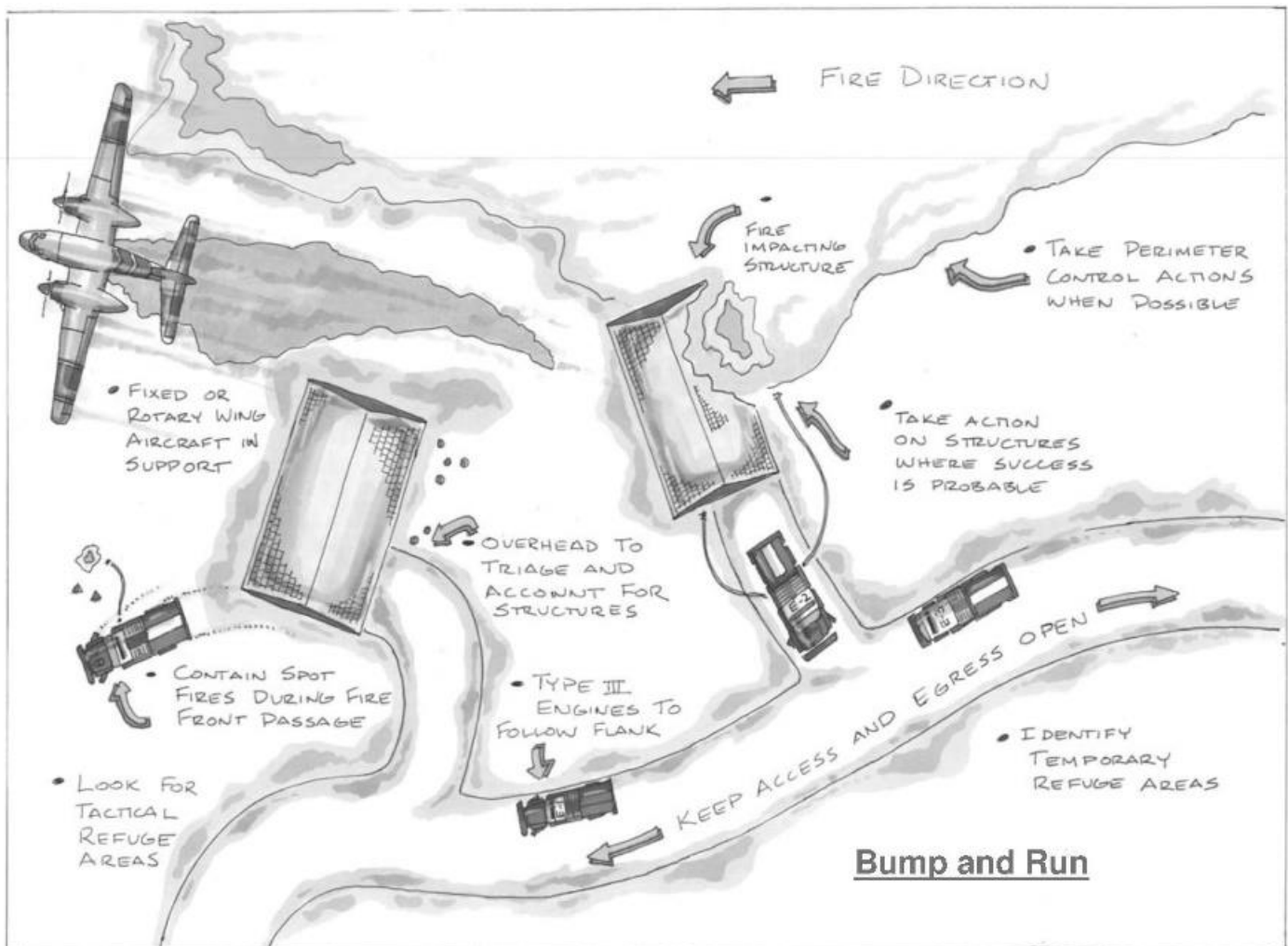
- **Purpose:** Defend exposures, stop structure to structure ignitions, reduce ember production and extinguish structure fires.
- **Indicators:** Primary mechanism of fire spread is STRUCTURE to STRUCTURE in common neighborhoods or commercial areas.
- **Actions:** Tactical utilization of control lines and large water streams from fixed water supplies.
- **Considerations:** Only utilized when water supplies are abundant. Utilization of gels and class "A" foams to assist in mop-up and prevent secondary ignitions.



# WILDLAND – STRUCTURAL PROTECTION

## 3. BUMP & RUN

- **Purpose:** Often used when inadequate resources are available to conduct perimeter control or other structure defense tactics.
- **Indicators:** Defensive tactic when fire front impact is imminent. Offensive tactic when resources are attempting to steer the fire to an established end point where other resources have prepared control lines. Structure prep is minimal due to compressed time constraints.
- **Actions:** Resources move ahead of the fire front to extinguish spot fires, hot spots and defend structures. Resources remain mobile, able to maneuver quickly, leapfrogging from one structure to another.
- **Considerations:** Situational awareness and utilization of PACE Planning. May involve direct attack with fireline and firing operations. FFs must move if structures become involved and quick knockdown cannot be achieved. Utilization of additional resources behind “bump and run” for perimeter control and tactical patrol.



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## TACTICAL PATROL

- **Purpose:** Tactic used before or after fire front that relies on mobility of assigned resources to continually monitor assigned areas
- **Indicators:** Before or after fire front in which the fire may pose a risk to structures from fire brands or smoldering combustibles in void spaces, roofs, in rain gutters and stored material near buildings. Also, in areas away from the fire in which there is predicted to be significant ember showers and there is an accumulation of receptive fuels.
- **Actions:** Patrol area where the fire has passed but there is still a risk to structures from fire brands
- **Considerations:** Patrol areas downwind of potential ember showers. This tactic should also be considered to extinguish hot spots (mop up) or secondary structure ignitions, and address safety issues such as power lines, hazard trees and other hazards.

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## III. Overhaul

**Many structures have been lost after successfully pushing the fire front around but not following up with adequate overhaul. Embers may maintain heat for long durations in the right fuel beds.**

**Thermal Imagers provide great value when searching out hot spots.**

### **Procedure:**

1. Check structures every 30 minutes or as frequent as possible.
2. Consider assigning a ST/TF or multiple units to a geographic location where the fire has passed.
3. Whether you engaged the fire or are returning to the structure after the fire has passed, you should concern yourself with three overhaul zones: the structure itself, the site around the structure, and the burned edge in the vegetation.

The structure itself:

- Overhaul any charring and check for further extension
- Check under decks, in gutters, and eaves
- Check around roof and foundation vents, shingles, and roof tiles
- Check any path which flying brands may have entered the building
- Where possible, check the interior and attic space

SITE AROUND THE STRUCTURE:

- Completely overhaul any spot fires, look for any smokes or heat indicators; decorative landscaping, bark mulch, wood piles, etc.
- Look overhead for smoldering in trees, power poles or other exposures
- Ensure access is clear of any obstacles resulting from the fire.

BURNED EDGE IN THE VEGETATION:

- A minimum mop up standard of 20' in from the edge of the black should be accomplished. If high winds are expected or the structure is upslope from the perimeter, increase the mop up to 50' from the edge.
- Utilize wildland hand tools during mop up; this will ensure the water/foam penetrates the materials (leaf litter, duff, etc.) to reduce the potential for flare ups and allow the water to go further.
- Where appropriate utilize hand tools to construct a hand line to secure the edge of the fire and ensure containment. As a rule of thumb, the line width should be 1 ½ times the height of the fuel.
- Look up and down. Smoldering or active burning may be present in the tree tops, knot holes or root systems.