Alberta Wildland Urban Interface Pocket Guide

Size Up Report

1. **Problem Description**
   (ex. Running Grass Fire)

2. **State the HFI of the Largest Flames**
   (HFI 1, 2, 3, 4, 5, 6)

3. **Approximate Fire Size**
   (Hectare(s) or Meters x Meters)

4. **Direction of Travel of the Head Fire**
   (North, South, East, West)

5. **Weather Conditions**
   (Wind Speed and Direction, Temp, RH)

6. **Incident Action Plan**
   (What are You Going to do About it?)

7. **Values Potentially at Risk**
   (Life, Structures, or Infrastructure)

8. **Determine Resources**
   (Any Additional Other than IA)

9. **Assume & Name Command**

Alberta Wildland Urban Interface Reference Guide

2022

Disclaimer:

The *Alberta Wildland Urban (WUI) Interface Pocket Guide* establishes standards for wildland fire incident response within the province of Alberta. The guide provides critical information on operational engagement, strategies, tactics, safety, and incident command. It provides a collection of best practices that have evolved over time within the fire service.

The *Alberta Wildland Urban (WUI) Interface Pocket Guide* does not provide absolute solutions to the unlimited number of situations that may occur. The decisions made often require each individual's judgement, creativity and skills developed through extensive training, dedication, practice and experience. The decisions, liabilities and outcomes of those decisions rest solely on those making the decision(s).

This guide was made in collaboration with Clearwater Regional Fire Rescue Service, High Level Fire Department, Alberta Wildfire, Alberta Emergency Management Agency, the Government of Alberta, and the Government of Canada.

Created by: Battalion Chief Jared Opdendries

Table of Contents

Page Intentionally Left Blank

Incident Priorities

1. Life Safety
2. Incident Stabilization
3. Property/Environment Preservation

Check Your Ego at the Door

It's about the incident outcome. You must support the incident outcome regardless of your own opinion. Think big picture. Remember everyone has something to offer: local knowledge, skills and resources. Knowing when to apply these is what makes for a great team and the best incident outcome possible.

10 Firefighter Standing Orders

FIRE BEHAVIOUR

1. Keep informed on fire weather conditions and forecasts.
2. Know what your fire is doing at all times.
3. Base all actions on current and expected behaviour of the fire.

FIRELINE SAFETY

4. Identify escape routes and safety zones and make them known.
5. Post lookouts when there is possible danger.
6. Be alert. Keep calm. Think clearly. Act decisively.

ORGANIZATIONAL CONTROL

7. Maintain prompt communications with your forces, your supervisor, and adjoining forces.
8. Give clear instructions and ensure they are understood.
9. Always maintain control of your forces.

IF YOU'VE CONSIDERED 1 THROUGH 9, THEN

10. Fight fire aggressively, having provided safety first.

10 WUI Watch Out Situations

1. Poor access and narrow one-way roads.

2. Bridge load limits.

3. Wooden construction and wood shake roofs.

4. Power lines, propane tanks, and HazMat threats.

5. Inadequate water supply.

6. Natural fuels 10 meters or closer to structures.

7. Structures in chimneys, box canyons, narrow canyons, or on steep slopes (30% or greater).

8. Extreme fire behaviour.

9. Strong winds.

10. Evacuation of public.

17 Watch Out Situations

1. You are in country you have not seen in daylight.
2. You are constructing a line without a safe anchor point.
3. You are attempting a frontal assault on a fire.
4. There is unburned fuel between you and the fire.
5. You are building a fireline downhill with fire below.
6. You are on a hillside where rolling material can ignite fuel below.
7. The weather is getting hotter and drier.
8. The wind increases and/or changes direction.
9. You are getting frequent spot fires across the line.
10. The terrain and fuels make escape to safety zones difficult.
11. You feel like taking a nap near the fireline.
12. You are unfamiliar with local factors influencing fire behaviour.
13. You are working in an area where numerous snags and hazard trees are present.
14. The management of the fire is transitioning.
15. You are driving when fatigued and/or in conditions where darkness, dust and/or smoke make visibility difficult.
16. The fire is in an urban interface
17. You have significantly exceeded the 2:1 work/rest ratio, or you have been operating at the 2:1 ratio for an extended period.

Safety

Risk Management Process

1. Situational Awareness
2. Hazard Assessment
3. Decision Making
4. Re-evaluate

Lookouts Someone who watches your back.

Anchors A location to start building control lines from.

Communications Clear instructions and make sure they are understood.

Escape Routes Quickest way to safety zone.

Safety Zones An area firefighters can retreat to that will provide protection from the fire. **Minimum 8x vegetation height.**

Contingency Planning

Primary Plan - focus is safety, then objective

Alternate Plan - fallback that supports primary plan

Contingency Plan - firefighter safety

Emergency Plan - individual firefighter survival

Special Safety Considerations

Down Power Lines: DO NOT approach! Treat as if they are energized. Report to your supervisor immediately. *Follow the power company's safety procedure.*

Civilian Intervention or Resistance to Evacuate: Keep calm and try to keep them calm. Inform your Supervisor immediately. Law enforcement may be required.

Propane and Compressed Gas Cylinders: Be aware of their location, remove from other fuels (brush) if able. Mark on Triage Forms. Set up sprinkler protection if able. Turn off valves if fire is imminent.

Livestock or Pets: If aggressive, do not approach. Notify supervisor. Only release or turn loose if fire is imminent. Use extreme caution. This will add a new hazard.

Traffic: Plan route. Have multiple backup routes. Use caution with low visibility. Activate emergency lights.

Don’t forget to DECON your PPE regularly

Common Denominators of Fatality Fires

1. On relatively **small fires** or deceptively quiet sectors of large fires.

2. In relatively **light fuels**, such as grass, herbs, and light brush.

3. When there is an unexpected **shift in wind** direction or in wind speed.

4. When fire responds to **topographic conditions** (ex. chimneys, gullies, or steep slopes) and runs up hill.

Leadership Values and Principles

Duty

- Be proficient in your job, both technically and as a leader.
- Make sound and timely decisions.
- Ensure that tasks are understood, supervised, and accomplished.
- Develop your subordinates for the future.

Respect

- Know your subordinates and look out for their well-being.
- Keep your subordinates informed.
- Build the team.
- Employ your subordinates in accordance with their capabilities.

Integrity

- Know yourself and seek improvement.
- Seek responsibility and accept responsibility for your actions.
- Set the example.

Roles and Responsibilities

Wildland Urban Interface Crew Member (WUIM):

- Responsible for performing tactical assignments during the pre-impingement, impingement, and post-impingement phases.
- Must report to the Crew Boss.

Wildland Urban Interface Crew Boss:

- Responsible for supervising and performing tactical assignments assigned to Structure Protection during the pre-impingement, impingement and post-impingement phases.
- The Crew Boss is responsible for the crew of a particular apparatus and reports to the Strike Team/Task Force Leader.

Roles and Responsibilities

Structure Protection Specialist (STPS2)

- Responsible for coordination and implementation of structure protection strategies and tactics within a Structure Protection Division and/or Group.
- Directs the Structure Protection resources as Division/Group Supervisor in the Operations Section and/or provides technical expertise to the Structure Protection Branch Director as a Structure Protection Technical Specialist in the Planning Section.

Structure Protection Specialist (STPS1)

- Responsible for overall coordination and implementation of structure protection strategies and tactics.
- Directs the Structure Protection resources as Branch Director in the Operations Section and/or provides technical expertise.

Gather Daily Information

- Weather forecast
  - Today, tonight, tomorrow
- Fire situation
  - Fire growth
  - Fire weather indices
  - Forecasted fire behaviour
  - Observed fire behaviour
- Values at risk
  - Identified
  - Specific to assigned area
  - Special hazards
  - Density of values
- Available resources
  - What and how many
  - Type and kind
  - Location
- Strategy and tactics
  - Based on weather, fire behavior, and fuel
  - Offensive (direct) or Defensive (indirect)
  - Safety (LACES, PACE)
- Other considerations
  - Time of year and/or day
  - Check-in requirements
  - Special prevention measures (fire ban, SOLE)
  - Safety hazards (H2S facility)

Wildfire On Site Assessment

1. Fire size and location_____ Degrees Minutes Decimal 52° 22.10’ N 114°54.17’ W

   _____

2. Fire behaviour
   - Fuel type_____
   - Weather_____
   - Topography_____
   - Intensity class_____ ROS_____m/min
   - Direction of spread_____
   - Description (circle one) smoldering, creeping, running, torching, crowning

3. Values at risk_____

   _____

   _____

4. Access_____

   _____

   _____

5. Control capabilities_____

   _____

   _____

6. L.A.C.E.S.
7. Possible cause(s)_____

   _____

   _____

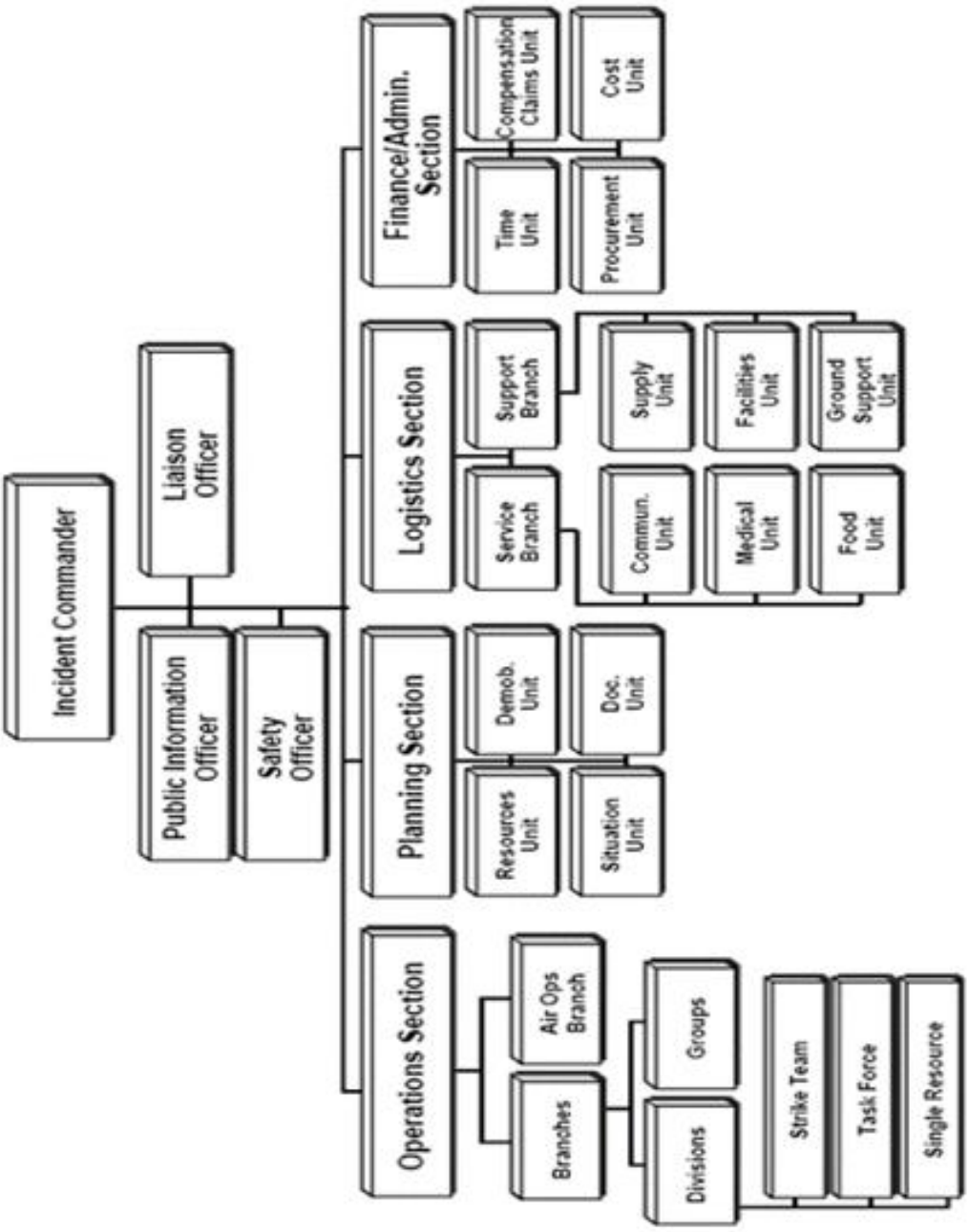
8. Notes_____

   _____

   _____

Organizational Chart

Know where you fit into the organizational chart.
Refer to ICS form 204 in the IAP.



WUI Engine Task Force Structure

This is a typical Alberta Wildland Urban Interface Engine Task Force. This compliment works well for most applications. However, this is not and was not designed to be all encompassing. Each incident is different and unique. The strategies and tactics must be customized to address the uniqueness of the incident.

Type 3 Engine

- Crew Boss
- Driver / Operator
- Crew Member
- Crew Member

- Crew Boss
- Leads the attack
- Implements the tactical plan
- Monitors fire behavior
- Responsible for documentation

Type 6 Engine

- Crew Boss
- Driver / Operator
- Crew Member
- Crew Member

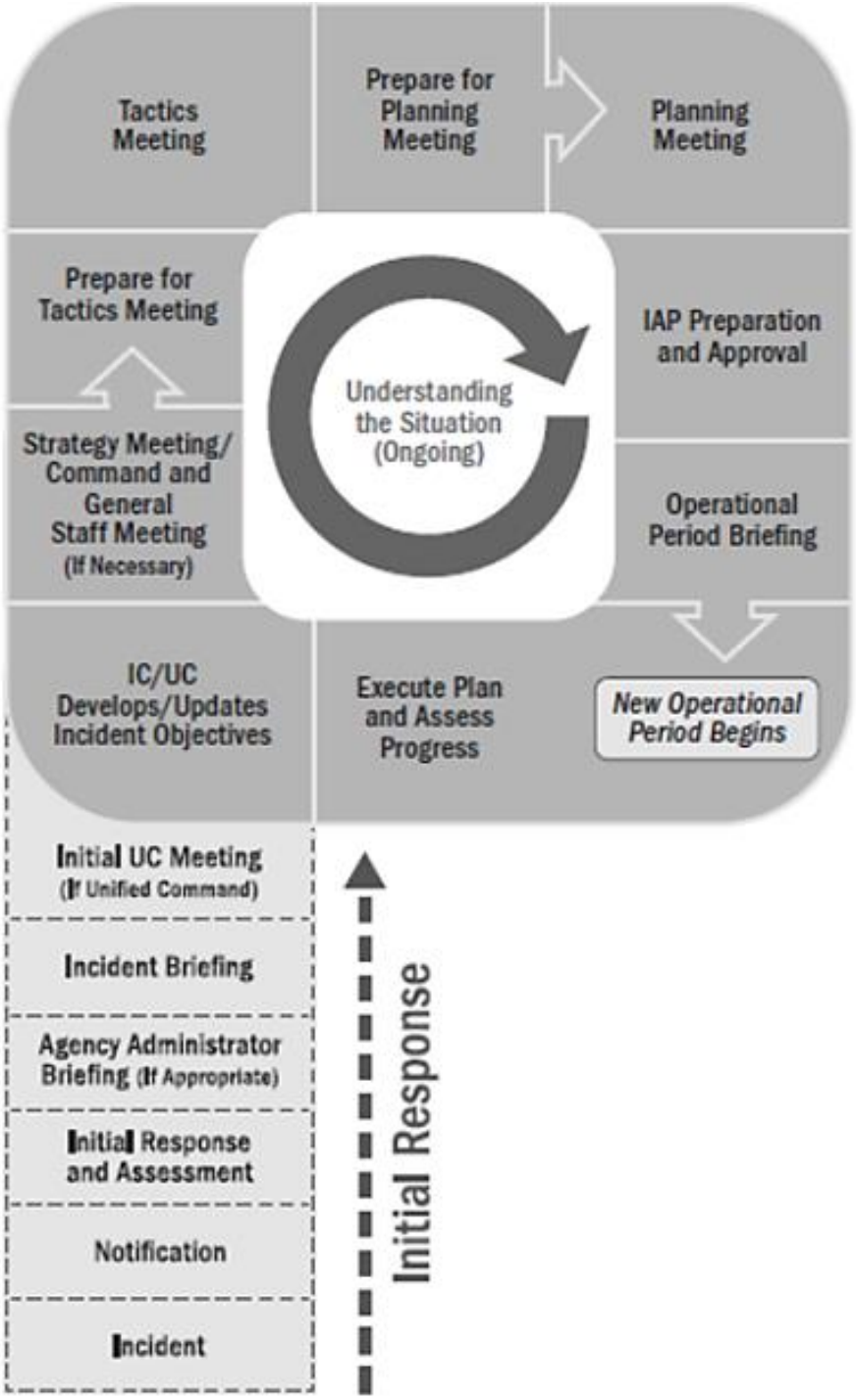
- Second in command
- Lookout
- Can act as sprinkler crew
- Ensure escape routes and safety zones are identified and clear

Type 1 Tactical Tender

- Officer
- Driver / Operator

- Establish and maintains water supply
- Monitors fire behavior
- Supply apparatus as requested

Planning P


Tactics Meeting
Prepare for Planning Meeting
Planning Meeting
Prepare for Tactics Meeting
Understanding the Situation (Ongoing)
IAP Preparation and Approval
Strategy Meeting/ Command and General Staff Meeting (If Necessary)
Operational Period Briefing
IC/UC Develops/Updates Incident Objectives
Execute Plan and Assess Progress
New Operational Period Begins
Initial UC Meeting (If Unified Command)
Incident Briefing
Agency Administrator Briefing (If Appropriate)
Initial Response and Assessment
Notification
Incident
Initial Response

Unified Command Best Practices

A. One set of objectives is developed for the entire incident.

B. Collective approach is used to develop strategies to achieve incident objectives.

C. Improved information flow and coordination between all jurisdictions and agencies involved in the incident.

D. All agencies with responsibility for the incident have an understanding of one another's priorities and restrictions.

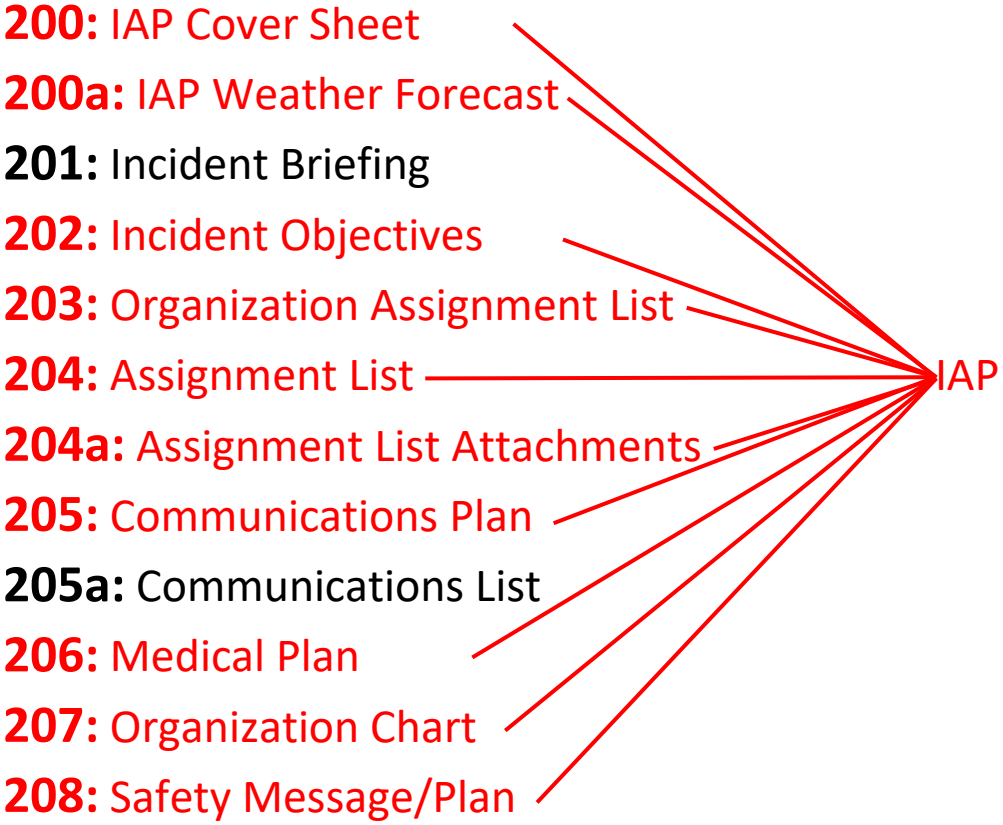
E. No agency's authority or legal requirement are compromised or neglected.

F. Each agency is fully aware of the plans, actions and constraints of all others.

G. The combined efforts of all agencies are optimized as they perform their respective assignments under a single IAP.

H. Duplications of efforts are reduced or eliminated, reducing cost and potential for frustration and conflict.

ICS Forms List



209: Incident Status Summary

210: Resource Status Change

211: Incident Check In

211e: Equipment Check In

211p: Personnel Check In

213: General Message

213rr: Resource Request Message

ICS Forms List

214: Unit Log
214a: Personal Log
215: Operational Planning Worksheet
216: Communications Requirement Worksheet
217: Communications Resource Availability Worksheet
218: Support Vehicle Inventory
219: Resource Status Card (T-card)
220: Air Operations Summary
221: Demobilization Check-Out
222: Incident Weather Forecast Request
223: Health and Safety Message
224: Crew Performance Rating
225: Incident Personnel Performance Rating
226: Message Log
227: Claims Log
228: Incident Cost Worksheet
230: Daily Meeting Schedule
232: Resource at Risk Summary
233: Incident Open Action Tracker
234: Work Analysis Matrix
237: Incident Mishap Reporting

ICS Types

Primary Mobile Suppression Resource Type			
Component	**Type 1**	**Type 3**	**Type 6**
Engine			
Pump LPM (GPM)	3785 (1000)	568 (150)	190 (50)
Tank Minimum Capacity Litres(gal)	1135 (300)	1893 (500)	568 (150)
Rated Pressure kPa (PSI)	1034 (150)	1723 (250)	690 (100)
Hose 2.5” - Metres (Feet)	366 (1200)		
Hose 1.5” - Metres (Feet)	152 (500)	305 (1000)	91 (300)
Hose 1” - Metres (Feet)		152 (500)	91 (300)
Ladder per NFPA 1901	Yes		
Master Stream	Yes		
Pump and Roll		Yes	Yes
Personnel Minimum	4	3	2
Tactical Water Tender (Pump and Roll Capability)			
Pump LPM (GPM)	946 (250)		
Water Tank - Litres (gal)	7570 (2000)		
Personnel	2		
Support Water Tender			
Pump LPM(GPM)	1135 (300)	757 (200)	
Water Tank Litres (gal)	15141 (4000)	3785 (1000)	
Personnel	1	1	

Alberta SPU Type

(Totals of basic equipment)

Components	Type 1	Type 2	Type 3
Pump	N/A	6	2
Hose	N/A	345	160
Sprinklers	N/A	130	71
Bladders	N/A	2	1
Approx. Structures	N/A	21-30	10-20

Aircraft Types

Resource	Components	Type 1	Type 2	Type 3	Type 4
Air Tanker	Litres (gal)	11356(3000)	6814(1800)	3028(800)	757(200)
	Examples	Electra			Air Tractor
Helicopter	Seats, including Pilot	16	10	5	3
	Weight Capacity Kg(lb.)	2268(5000)	1133(2500)	544(1200)	272(600)
	Litres (gal)	2650(700)	1135(300)	380(100)	284(75)
	Examples	Bell 214	Bell 204, 205, 212	Bell 206	Hiller

State Of Local Emergency

(SOLE)

***Alberta Emergency Management Act*: Part 2**

- Must be communicated to the public immediately
- Emergency Operation Plans into Action
- Able to restore essential supplies/control distribution of essential supplies
- Order an evacuation
- Control or prohibit travel to or from an area
- Authorize entry onto private property
- Able to construct access roads and/or guards where needed
- Cause demolition or removal of trees, crops or structures to reach or combat the progress of the incident

Insurance/Liability

For Firefighter and Incident Personnel:

AEMA, Alberta WUI Fires Document, Section 3.1

For Equipment Damage or Loss:

Alberta Structure Protection Program Operational Guidelines 5. Reimbursement Guidelines

For Infrastructure Damage or Loss:

AEMA Alberta WUI Fires Document, 5.2 Disaster Recovery Program (DRP)

ICS Terms

Type 1: is the bigger and/or more equipped/trained resource. Not necessarily the best for the task.

Strike Team: consists of a set number of resources of the same kind and type operating under a designated leader. (Think, strike, alike)

Task Force: any combination of resources convened to accomplish a specific task operating under a designated leader.

There is no combination of a strike team and task force

Single Unit Resource: Resources may be employed on a single basis, such as individual personnel or equipment, usually a specialty resource (SPU, ARFF, STPS).

Unified Command: is needed when the affected area crosses into more than one jurisdiction. It aids in everyone working towards the same goal.

Wildland and Structural Firefighter

Structural

Fire Engine (Engine, Pumper) 2-6 Person Crew: Fire truck with a pump, onboard water tank and tools.

Ladder/Aerial 2-6 Person Crew: Fire truck with a hydraulically operated ladder or elevated platform.

Water Tender (Tender) 1-2 Person Crew: Fire truck or commercial water truck designed to carry large amounts of water to fill or support a Fire Engine.

Brush/Bush Truck (Brush, Bush, Rapid) 2-4 Person Crew: A smaller Fire Engine with pump and roll capabilities (Type 3 or less).

Structure Protection Unit (SPU) 4 Person Crew: A truck and trailer with equipment designed to protect structures from wildfire (sprinkler trailer).

White Helmet: Chief Officer.

There is no standard for other helmet colors.

Wildland and Structural Firefighter

Wildland

Helitack (HAC) 4 or 8 Person crew: Initial action

Firetack (FTAC) 8 Person crew: Sustained action

Unit Crew (Unit) 20 Person crew: Contain and extinguish

White Helmet: Division Supervisor or Wildfire Ranger

Yellow Helmet: Crew Lead

Blue Helmet: Crew Sub-Lead

Red Helmet: Wildland Firefighter

After Action Review (AAR)

An AAR is performed as immediately after the event as possible.

The leader's role is to ensure skilled facilitation of the AAR.

Reinforce that respectful disagreement is ok.

Keep focused on the what, not the who.

Make sure everyone participates.

End the AAR on a positive note.

Some questions to ask:

What was planned?

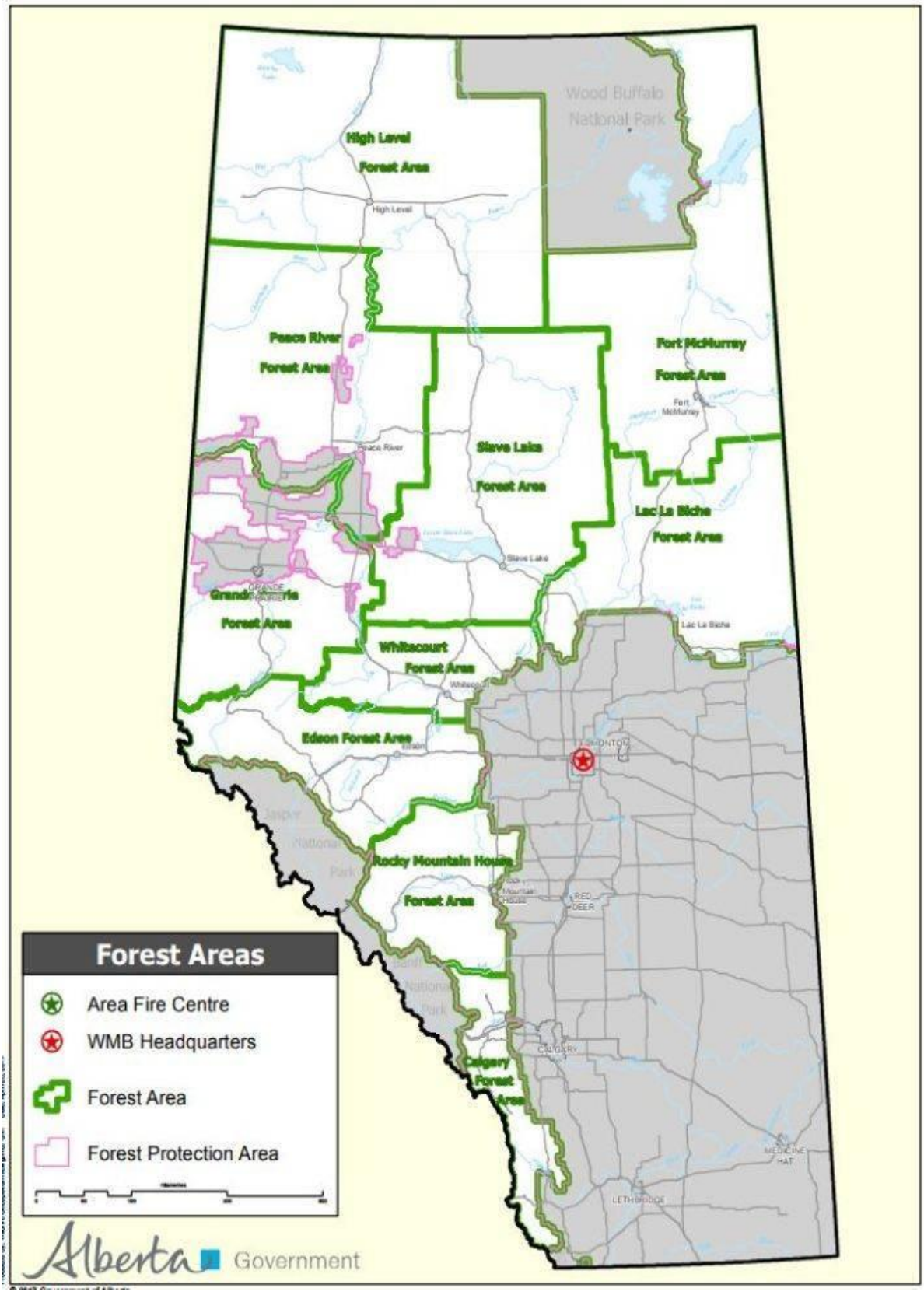
What actually happened?

Why did it happen?

What can we do next time?

Ensure the atmosphere surrounding the AAR is open and honest for all participants.

Wildfire Management Branches



Notes:

Notes:

Wildfire Status

Out of Control (OC): The wildfire is expected to continue to grow.

Being Held (BH): With given weather conditions and resources, the wildfire is not anticipated to grow past expected boundaries.

Under Control (UC): Wildfire is completely contained and will be extinguished.

Weather Changes Associated with Cold and Warm Fronts

Cold Front					Warm Front		
	Before Passing	*While Passing*	*After Passage*		*Before Passing*	*While Passing*	*After Passage*
Wind	S or SW	Gusty, shifting	W or NW or N		S or SE	Variable	S or SW
Temp	Warm	Dropping	Dropping, then steady, cooler		Cool, warming slowly	Rising	Warmer, then steady
Precip	Scattered showers	Heavy T-storms possible	Scattered showers, clearing		Light to moderate rain, drizzle	Drizzle	Clearing
Visibility	Fair, haze possible	Poor in rain, improving	Good		Poor	Poor, improving	Fair, haze possible
Dew Point	High	Sharp drop	Lowering		Steady rise	Steady	Rising, then steady

Wildfire Fuel Types

C1: Spruce/lichen woodland, which includes mostly black spruce growing in patches.

C2: Boreal spruce which includes black spruce, white spruce trees growing close together.

C3: Mature jack or lodgepole pine, fully mature pine in closed stands.

C4: Immature jack or lodgepole pine, densely stocked immature pine.

C5: Red and white pine, mature; associated with white spruce, white birch, and aspen.

C6: Conifer plantation, complete crown closure regardless of mean stand height.

C7: Ponderosa pine, douglas fir, open stands, mature uneven-aged.

D1: Leafless aspen, fall and spring.

D2: Green Aspen, after leaf flush.

M1: Boreal mixed wood, leafless, mixed stands of conifer (spruce and pine) and deciduous (aspen and birch) trees in the leafless stage.

M2: Boreal mixed wood, green, mixed stands of conifer and deciduous trees in full leaf stage.

M3: Dead balsam fir mixed wood, leafless.

M4: Dead balsam fir mixed wood, green.

S1: Lodgepole or jack pine slash.

S2: White spruce, balsam slash.

S3: Coastal cedar, hemlock, douglas fir slash.

O1a: Matted grass.

O1b: Standing grass.

Grass Curing

Definition: The percentage of dead grass as compared to live grass (e.g. 60% cured means 60% of the biomass is dead).

- ~20% cured, fire starts to actively spread.
- ~60% is a threshold for an increased ROS and consumption.

Fuel Loading

- Nominal fuel load of 3.5 t/ha
- Unharvested, fires spread 2 km/h ***faster*** and had 1.9 m ***taller*** flames than harvested
- Harvested & baled, fires spread 2 km/h ***slower*** and 1.2 m ***shorter*** flames than harvested

Fire Behaviour (effects of FFMC)

3 important factors

1. Degree of curing (%)
2. Fine Fuel Moisture Code (FFMC)
3. Wind speed (km/hr)

→ Initial Spread Index (ISI)

pg. 39-40

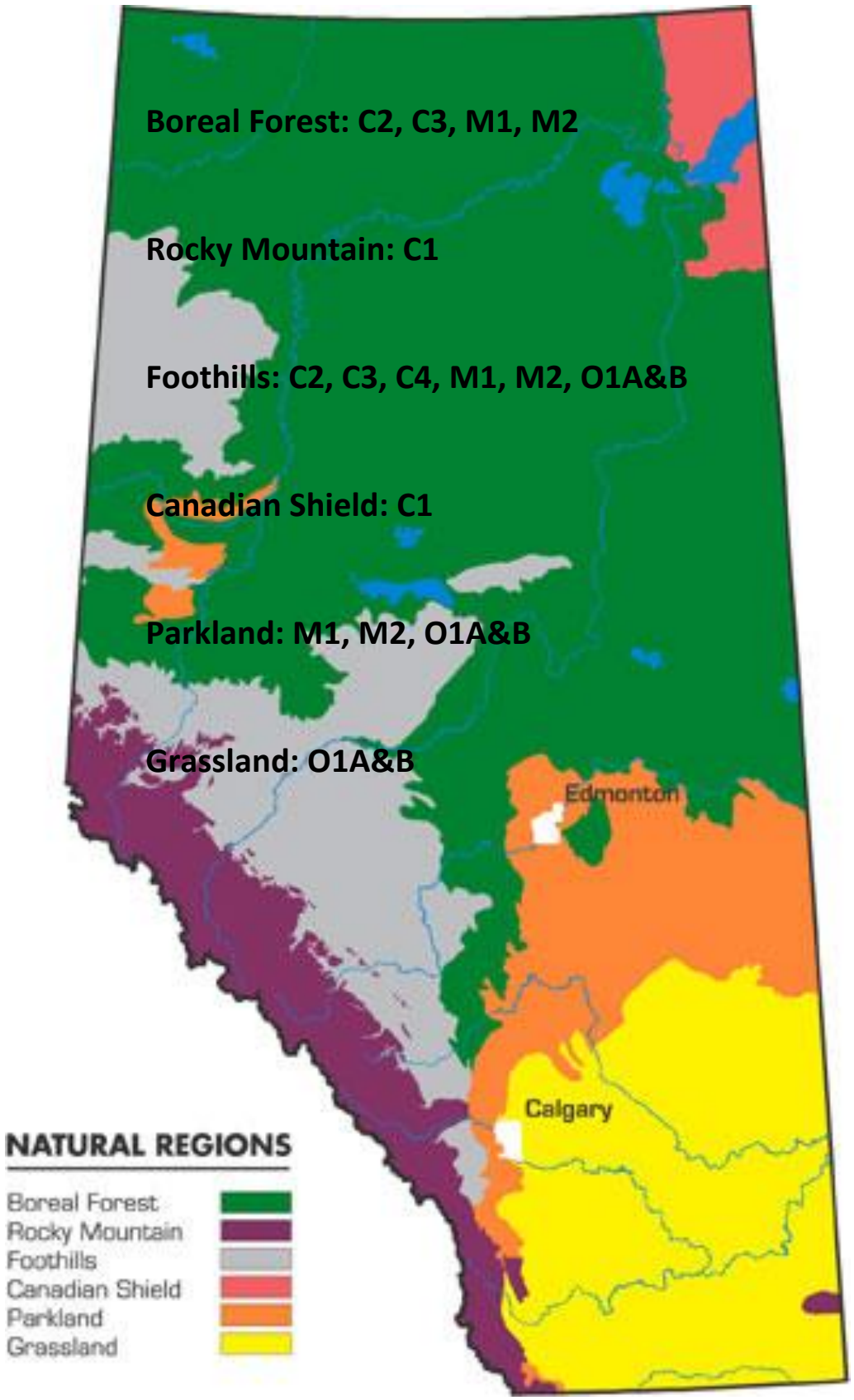
90% cured, FFMC **84**, **35** km/h wind HFI CLASS **4**(assumed 3.5 t/ha)

80% cured, FFMC **90**, **30** km/h wind HFI CLASS **5**(assumed 3.5 t/ha)

90% cured, FFMC **93**, **35**km/h wind HFI CLASS **6**(assumed 3.5 t/ha)

Safety Considerations: Crew Speed

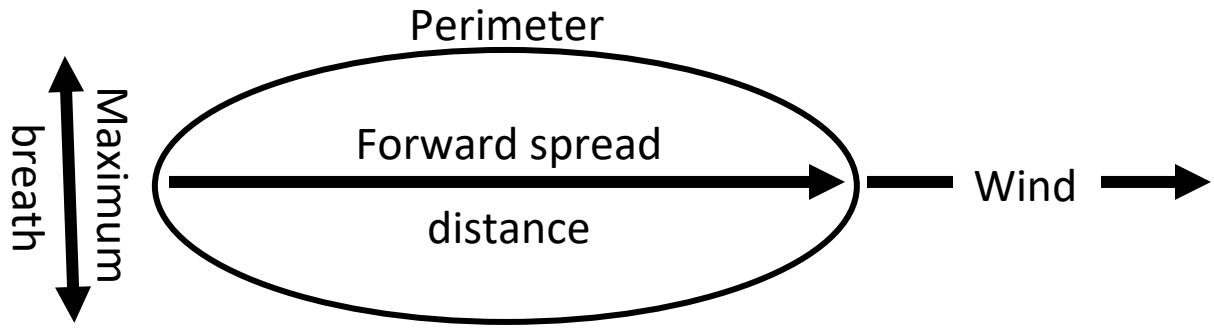
Wildfire crew with gear in 0-1a, flat	134 m/min	for 500m
Wildfire crew with gear in C-2, flat	96 m/min	for 500m


Boreal Forest: C2, C3, M1, M2
Rocky Mountain: C1
Foothills: C2, C3, C4, M1, M2, O1A&B
Canadian Shield: C1
Parkland: M1, M2, O1A&B
Grassland: O1A&B
Edmonton
Calgary
NATURAL REGIONS
Boreal Forest
Rocky Mountain
Foothills
Canadian Shield
Parkland
Grassland

Grass Fire Field Guide

A guide for estimating the behaviour and suppression requirements of fire driven by wind from a constant direction, in open, fully cured grasslands at low fuel moisture.

Caution: Flame heights at the fires head will be greater than 2.5 meters. Under NO circumstances should direct attack be mounted on the fires head. Any containment action must begin from a secured anchor point and progress along the flanks towards the head as the fires edge or perimeter is “knocked down.”



The Trees absent and Trees present classes refer to the absence or presence of trees/scrub within 20 meters of the windward side of the firebreak. The presence of trees or shrubs has a significant influence on firebreak effectiveness because they supply woody material for the embers, which can spot across.

Beaufort wind scale	Forward spread distance/perimeter length/ maximum breadth versus elapsed time since ignition				Head fire intensity	Head fire flame length	Minimum firebreak width required to stop head fire	
	kilometers				kW/m	meter	meters	
	0.5 hour	1 hour	1.5 hours	2 hours			Trees absent	Trees present
0-1	0.7/2.4/0.4	1.3/4.9/0.7	2.0/7.3/1.1	2.6/9.8/1.4	2300	2.7	5	12
2	1.0/2.7/0.4	2.0/5.5/0.7	2.9/8.2/1.1	3.9/10.9/1.5	3450	3.3	6	13
3	1.6/3.7/0.4	3.2/7.4/0.8	4.8/11.1/1.2	6.3/14.8/1.6	5550	4.1	7	15
4	2.7/5.7/0.6	5.3/11.5/1.1	8.0/17.2/1.7	10.7/22.9/2.2	9350	5.2	8	30+
5	4.4/9.1/0.8	8.7/18.2/1.5	13.1/27.3/2.3	17.5/36.4/3.1	15300	6.5	10	30+
6	6.1/12.5/1.0	12.2/25.0/1.9	18.2/37.5/2.9	24.3/50.0/3.8	21300	7.6	12	30+
7	7.2/14.8/1.0	14.5/29.5/2.0	21.7/44.3/3.1	28.9/59.1/4.1	25300	8.2	13	30+
8+	7.5/15.2/1.0	15.0/30.5/2.1	22.5/45.7/3.1	30.0/60.9/4.1	26200+	8.4+	14+	30+

Estimating Radiant Heat from HFI

Fire Intensity	Distance from Flame Front (m)									
kW/m (HFI)	1	5	10	20	30	40	50	60	70	80
	Radiation Intensity (kW/m^2)									
500 (2-3)	9.2	2	1	0.5	0.3	0.2	0.2	0.2	0.1	0.1
1000 (3)	17	3.9	2	1	0.7	0.5	0.4	0.3	0.3	0.2
2000 (3-4)	29.2	7.5	3.9	2	1.3	1	0.8	0.7	0.6	0.5
3000 (4)	37.9	10.9	5.7	2.9	2	1.5	1.2	1	0.9	0.7
4000 (4-5)	44.2	14	7.5	3.9	2.6	2	1.6	1.3	1.1	1

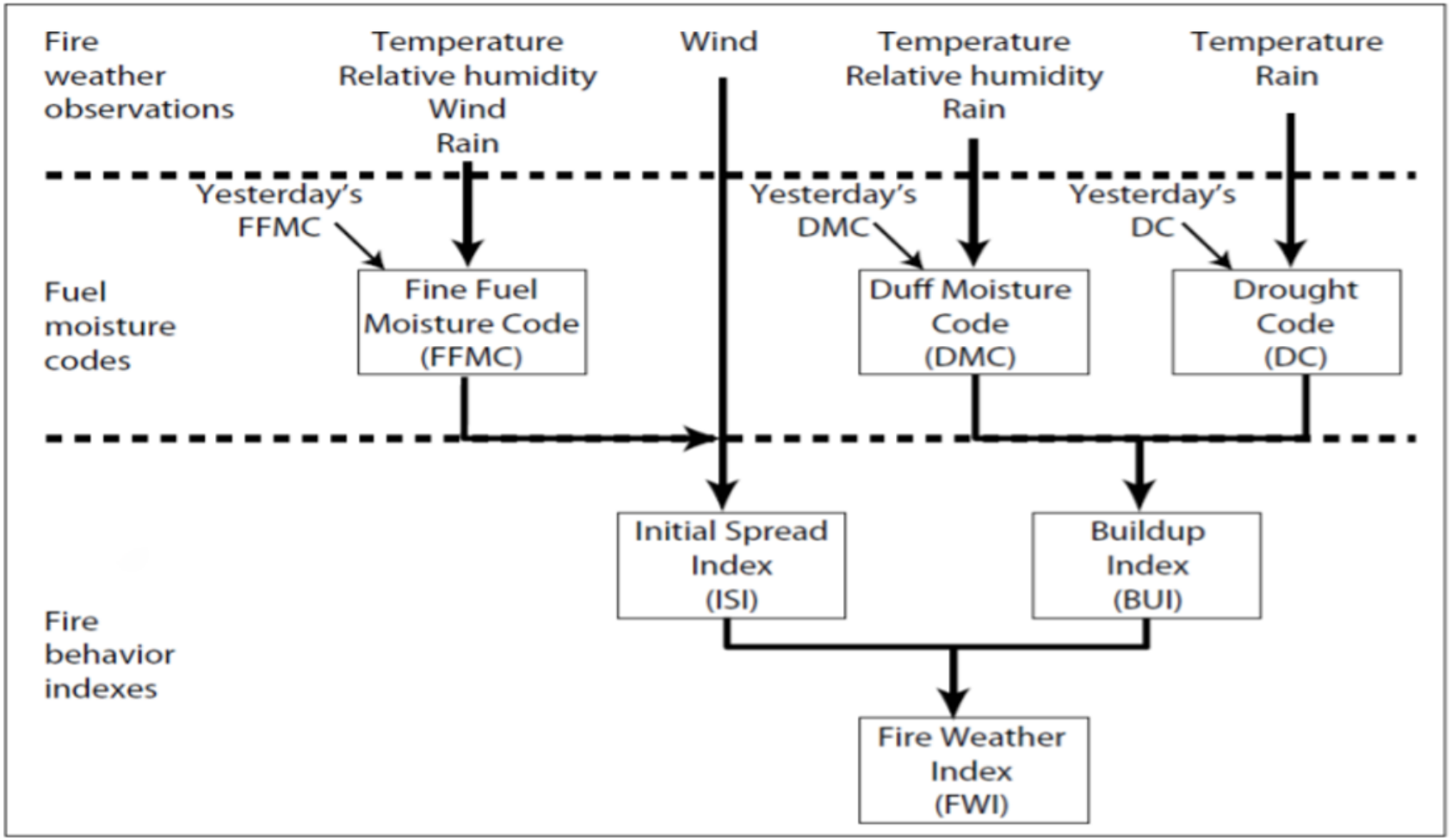
1.0 kW/m2: Exposed skin can withstand indefinitely

7.0 kW/m2: Maximum exposure for a firefighter with wildland PPE for 90 sec

84 kW/m2: Structural PPE Thermal Protective Test as per NFPA 1971

Extreme Fire Behaviour Indicators

- Copper-bronze smoke
- High rate of spread
- Prolific crowning and or increased spotting
- Fire whirls and or dust devils
- Strong convection column
- RH less than 15%
- Transition from surface to crown fire
- Smoldering fires that exist in the early part of the day are beginning to burn very actively as the day progresses
- Approaching thunderheads with dark clouds beneath
- Sudden calm
- High clouds moving fast in a direction that is different from surface wind


Fire weather observations
Temperature
Relative humidity
Wind
Rain
Wind
Temperature
Relative humidity
Rain
Temperature
Rain
Yesterday's FFMC
Yesterday's DMC
Yesterday's DC
Fuel moisture codes
Fine Fuel Moisture Code (FFMC)
Duff Moisture Code (DMC)
Drought Code (DC)
Initial Spread Index (ISI)
Buildup Index (BUI)
Fire behavior indexes
Fire Weather Index (FWI)

Fire Weather Forecasting

Key Components: Fuel

Temperature

Relative Humidity

Wind

Topography

Fire Weather Indices

Fine Fuel Moisture Code (FFMC) Range: 0-101

Moisture content of litter and other cured fine fuels.

Duff Moisture Code (DMC) Range: 0-Unlimited

Moisture content of loosely compacted organic layers of moderate depth.

Drought Code (DC) Range: 0-Unlimited

Moisture content of deep, compact organic layers.

Initial Spread Index (ISI) Range: 0-Unlimited

Expected rate of fire spread. It is based on wind speed and FFMC.

Build Up Index (BUI) Range: 0-Unlimited

Based on the DMC and the DC. Generally, less than twice the DMC value.

Fire Weather Index (FWI) Range: 0-Unlimited

Based on the ISI and the BUI and is used as a general index of fire danger.

Head Fire Intensity (HFI) Range: 1-6

A numerical ranking of difficulty of control for specific fuel types.

Fire Weather Index Reminders
FFMC
< 74 - little chance of ignition
80 - surface fire continuous spread
85 - increase in fire behavior
90 - high chance of spot fire development
DMC
20 - lightening fires possible
40 - fuel layer aids in spreading, fire behavior increases
60 - onset of extreme fire behavior
DC
<100 - very wet
300 - high chance of holdover fire, mop-up concerns
500 - significant ground fire activity
ISI
5 - vigorous surface fire (will vary between fuel types)
10 - threshold for crowing in most conifer fuel types
20 - extreme fire behavior
BUI
<30 - low intensity surface litter fires
30 - deeper fuels can burn, increase in fire behavior
60 - threshold for extreme fire behavior, mop-up problems
FWI
3 - sustained combustion and fire growth
10 - vigorous surface fire, candling/torching
25-30 - onset of crowning, extreme fire behavior

Fire Weather Index Codes - Hazard Levels							
Hazard Rating	FFMC	DMC	DC	ISI	BUI	FWI	HFI
Low	0-76	0-22	0-79	0-1.5	0-24	0-4	1
Moderate	77-84	23-27	80-189	1.6-4	25-40	5-10	2-3
High	85-88	28-40	190-299	4.1-8	41-60	11-18	3-4
Very High	89-91	41-60	300-424	8.1-15	61-89	19-29	4-5
Extreme	92+	61+	425+	15+	90+	30+	6

HFI 1	HFI 2	HFI 3	HFI 4	HFI 5	HFI 6
Flame Lengths <0.2m	Flame Lengths 0.2 – 1.5m	Flame Lengths 1.5 – 2.5m	Flame Lengths 2.5 – 3.5m	Flame Lengths 3.5 – 5.5m	Flame Lengths >5.5m
Direct Attack with hand tools	**Direct Attack** with hand tools	**Direct Attack** with pump and hose **or** air support	**Indirect Attack** air attack **successful** on head	**Indirect Attack** suppress flanks and back, coordinate ground & air tactics	**Indirect Attack** air attack likely to **fail** on head
<10 kW/m	10-500 kW/m	500-2000 kW/m	2000-4000kW/m	>4000 kW/m	>10,000 kW/m
Should Anchor	**Should Anchor**	**Should Anchor**	**Must Anchor**	**Must Anchor**	**Must Anchor**

Wildfire Fuel Factors

6 Important Factors

1. **Fuel Moisture Content**

2. **Fuel Condition** (Live or Dead)

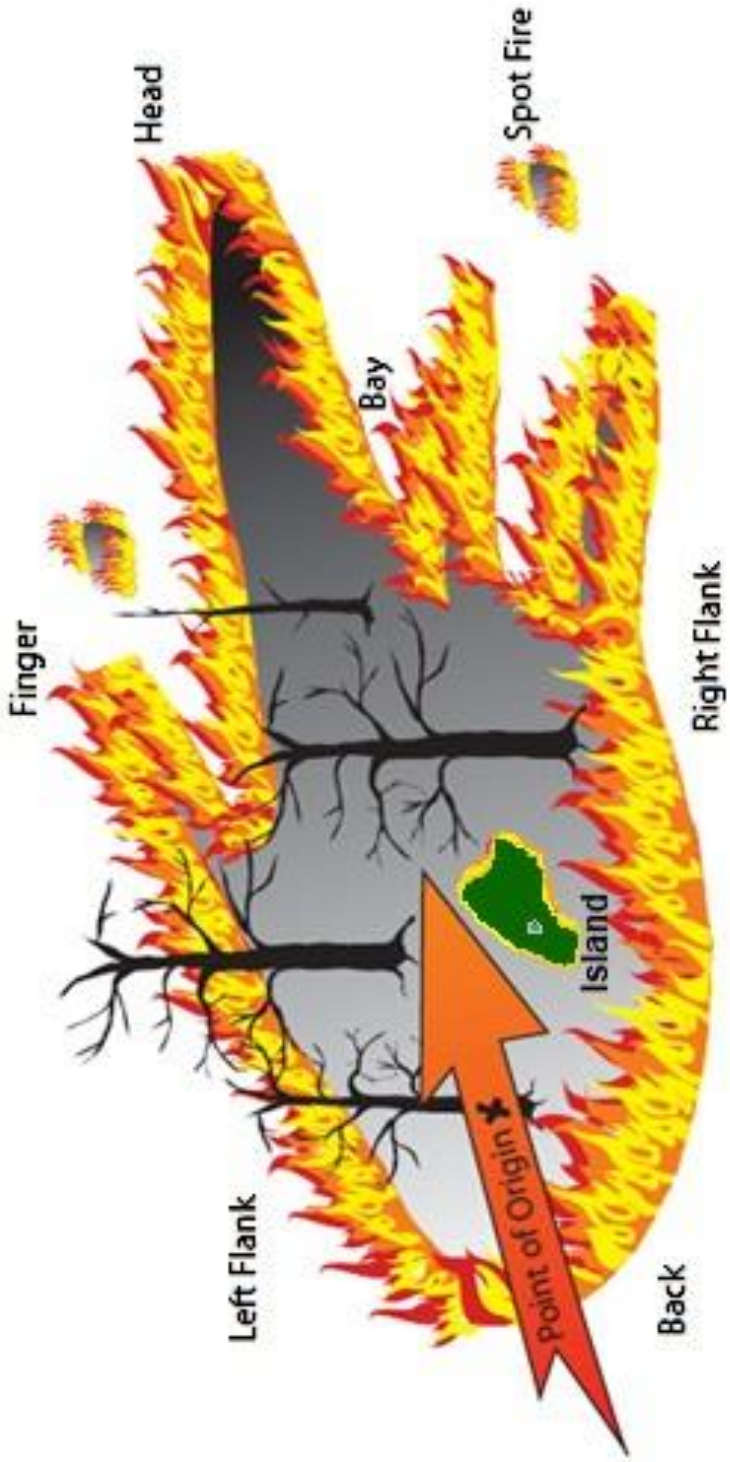
3. **Fuel Size Classification** (Fine, Medium, Heavy)

4. **Fuel Quantity** (Fuel Load)

5. **Fuel Arrangement** (Compact or Sparse)

6. **Fuel Continuity** (Continuous or Discontinuous)

Parts of a Fire



Notes:

Notes:

Personal Pre-Deployment Check List

☐Notify family and/or employer

☐Take care of any personal finances, childcare, animal care before deploying

☐No drugs or alcohol

☐No social media posts

☐Sleeping items (sleeping bag, pillow, cot or pad)

☐Tent (personal or crew size)

☐Adverse weather outerwear (rain, cold)

☐Personal hygiene items (toilet paper, soap, toiletries, feminine hygiene, bug spray, sunscreen)

☐72hrs self-sustaining (food, water, utensils, water purification, cash for food)

☐Personal first aid kit (add space blanket)

☐AFRRCS radio if available or radio with Provincial Mutual Aid channel (spare batteries, charger)

☐Cellphone (charger w/ cord, portable cellphone charger)

☐Any personal medication (your supervisor must know if you are taking any prescribed medications as per OH&S)

☐CSA Approved Sunglasses

☐Structural Firefighter PPE

☐Wildland Firefighter PPE

☐Chest Harness (add whistle to harness)

☐Handheld GPS/Compass

☐iPad or iPhone (works better with Avenza, air drop layers)

☐Earplugs (also used for sleeping next to others)

☐Bear Spray (do not carry in an aircraft)

☐Lighter

☐Over the Counter Medication (Allergy, Headache)

☐Electrical Tape

☐Civilian Clothes and Street Shoes

☐Laundry Soap

☐Pocket Knife/Multitool (Leatherman)

☐Headlamp and Flashlight

☐Note Pad, Pen/Pencil and Permanent Marker

☐Comfort/Entertainment Items (photos, favorite snack, books, sports ball)

Incident Check-In

ABDLAN# (Provincial Deployment)

Location and contact person for check-in

Route to take (Roads may be closed)

Each member and vehicle is required to sign in at check-in location

DO NOT FREELANCE **DO NOT SELF-DEPLOY**

Communications

WildFire

Channel usage varies by district

- FireLine - Simplex Channel (radio to radio)
- FireNet - Repeater Channel (to dispatch)

Structural

Some inter-agency channels

- Mutual Aid
- Fire Tac
- Provincial Ambulance
- RCMP Tac 9

Alberta First Responders Radio Communications System (AFRRCS): may have incident channels assigned

Make sure you have at least the 1 up and 1 down person(s) from your position's contact info (ex. call sign, phone number)

Refer to ICS form 205 in the IAP

Site Preparation

(FireSmart Zones)

Non-Combustible Zone (0-1.5m): No ignition sources for embers

☐Remove flammable liquids and gases containers

☐Remove door mats, furniture, decking if able

☐Close all windows and doors, close in around decking

☐Cover all roof vents and openings (only cover chimneys if absolutely necessary, if so, turn off fuel sources to prevent CO build up)

☐Remove leaves, twigs and debris from roof and rain gutters

☐Remove leaves, twigs/branches, wood piles, dead grass

Zone 1 (1.5-10m): Landscape that will not easily transmit fire to the structure

☐Same as Non-Combustible Zone

☐Open combustible fence gate if continuous to house

☐Thin, prune vegetation

Zone 2 (10-30m): 3m of horizontal space between the single or grouped tree crowns and remove all branches and ladder fuels to a height of 2m from the ground.

Zone 3 (30-100m): Fire breaks, thinning and pruning.

Structure Triage

Structure Triage Categories:

Not Threatened (needs no attention): Unlikely to be affected during impingement.

Threatened Defensible (needs protection): With site prep, sprinkler protection and/or Engine Ops it should survive impingement.

Threatened Non-Defensible (cannot be saved): Not safe to defend, will likely be lost.

Structure Protection Size Up:

Wind Speed Direction	Fuel Types
Topography	Egress Routes
Water Supply	Home and Yard Conditions
Out Buildings	Vehicles
Building Construction	Special Hazards
Burnout Possibility	Civilians Present

Firefighter Safety

Take lots of pictures, before, with equip. and after demob!

Use: Alberta Structure Triage Assessment Form

Sprinkler Pre-Plan

- Values at Risk
- Protection Strategies and Tactics
- Water Supply
- Functional Roles (Jurisdictional)
- Communications Plan
- Hazards
- Fire Behaviour Potential
- Auto Order List (Equipment and Resources Required)
- Community Safe Refuge Area
- Staging Area
- Trigger Points for Evacuation
- Evacuation Routes

Sprinkler Set Up

- Loop for better pressure distribution (pressure loop).
- Elevate sprinklers to simulate rainfall.
- Place on gable ends at highest points.
- Ensure sprinkler overlap.
- Cover any and all structure openings (if covering exhaust vents, shutoff fuel sources).
- Use smaller hose (5/8 GHT) for sprinkler attachment.
- Ensure sprinklers are securely fastened.
- Pump does not necessarily have to be at high RPM.
- Ensure adequate water supply.
- DO NOT cause damage to property. (water or physical)
- Always protect pump and hose.
- ALWAYS test the systems and walk the line.

WUI Placard

ICS 231

Flagging Standard

Use ribbon labelled with SPU

RED: No Go

YELLOW: Triaged Only

GREEN: Protected

ORANGE: Pump on Site

BLUE: Water Source

PINK: Escape Routes

CAUTION & DANGER: Hazards

Engine Operation Tactics

Defensive **Both** **Offensive**

- **Check and Go**
  Rapid evaluation to check for occupants
- **Prep and Go**
  Some prep of the structure and sprinkler setup
- **Fire Front Following**
  Resources engage in structure fire control ONLY on partially involved structures (25% or less involvement)
- **Bump and Run**
  Resources manoeuvre quickly leapfrogging from one structure to another
- **Tactical Patrol**
  Threat remains to structures after fire front passage
- **Prep and Defend**
  Personnel will likely stay and defend structure
- **Anchor and Hold**
  Defend exposures, stop structure to structure ignitions, reduce ember production, and extinguish structure fires
- **Sprinkler Protection Support**

  Starting systems and supporting them if able

If a structure roof is 25% or more involved, it is too far gone and will cost too many resources to attack. It must be abandoned.

Engine Operation Tactics

ALWAYS:

- Remember **LACES**
- Ensure *escape routes* are free and clear
- Spot your apparatus *pointing out* for quick egress
- Establish a *water source* (no more than 2km away)
- Keep *reserve water* (1/4 tank)
- *Top up* water and fuel at every opportunity
- Keep doors, windows and hose beds *closed/covered*
- Have a truck *protection line*
- **DO NOT park in unburnt fuel**

Go / No Go Checklist

This check list is meant to jog your memory for safe offensive engine operations. By no means is this list all inclusive (refer to disclaimer page). All personnel must be clear on their role and the plan prior to conducting operations.

☐ Is there a Lookout(s) in place?

Yes No If no – NO GO

☐ Are Anchor points established and available?

Yes No HFI of 4 or higher with no anchors is a NO GO

☐ Communication channel/plan and radio checks complete?

Yes No Poor comms or no plan is a NO GO

☐ Are escape routes clearly identified and tested?

Yes No

☐ What are your triggers to disengage from offensive tactics?_____

_____

_____

☐ How much time will it take to effect your escape plan?

Safety margin = T1 -T2 Time must be a positive number

_____

☐ Safety zones must be clearly identified and large enough for everyone (responders and public).

8 times vegetation height + room for all vehicle

☐ Are you expecting a decrease in fire behavior prior to engagement due to fuel breaks or change in fuels?

Yes No Greater than HFI 4 with no expected decrease in fire behaviour - NO GO

☐ Is this Offensive or Defensive?

Defensive – NO GO

☐ What is the rate of spread? _____

☐ Can you control the fire with the resources available?

☐ Have you accounted for the WUI watch outs and 17 watch out situations? pg. 3-4

☐ Have you followed the risk management process? pg. 5

Safety Margin Calculation

A safety margin is defined mathematically as follows (Beighley 1995):

Safety margin (+) = T1 – T2
T1 = the time for a fire to reach the safety zone
T2 = the time for a firefighter to reach the safety zone

A positive (+) safety margin implies that the firefighter can reach the safety zone before being overtaken by the fire, whereas a negative (-) safety margin implies that the fire can overtake a firefighter before the firefighter can reach the safety zone

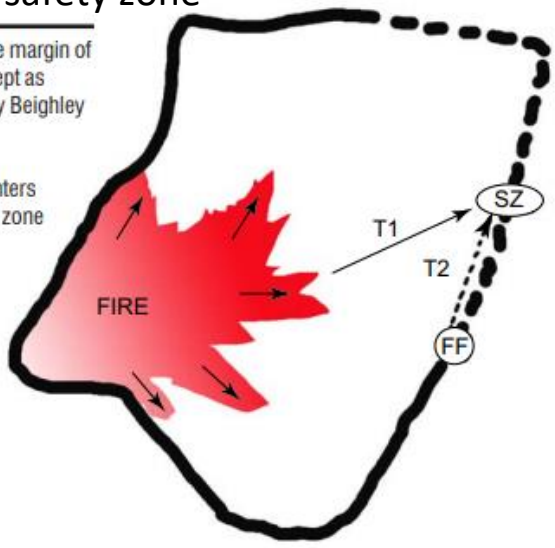


Figure 1. The margin of safety concept as described by Beighley (1995).

FF = firefighters
SZ = safety zone

Task Force Matrix

Factors to aid in calculating how many Task Forces (TF) are required for a given area. Also use the 10 WUI Watch Outs pg.3 and predicted fire behaviour, which dictates tactics (offensive/defensive) pg.57 as a reference to this guide.

Set Back from Road

This will cause longer travel times. Fuel type along roads and their set back from the road should be taken into consideration especially with HFI 4 or higher fire behaviour, this should affect your trigger point(s) decision.

Amount/Continuity of Structures

If there are more houses closer together, the TF could potentially do more structures within the same amount of time as opposed to if structures were more sparsely spaced. (urban vs rural)

Proper Fire Smart Zones

This will help the TF by reducing fire intensity as it gets closer to the structure. Therefore, buying the TF more time.

Distance and Time Between Properties

Approx. 15 min cycle to complete a rapid survey of the property once initial triage has been completed (drive by/ in). Depending on fire behaviour, this should give the TF enough time to catch any spot fires before they get too large.

Task Force Matrix Plan:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Pump Quick Specs

Waterax Mini-Striker:

Engine: 4 Stroke 2.1 hp

Fuel Mixture: Straight Gas

Pump: 303 LPM (80GPM), 586 kPa (85 psi)

Max Head Distance: 60m (196')

Max Distance (Rule of Thumb): 300m (985'), then add a relay pump

Weight: 9 kg (20lb)

Required Setup Equipment: Pump, Fuel, Suction Hose with Foot Valve Strainer, Discharge Check Valve, Discharge Hose, Pump Kit

Estimated Sprinkler Quantity (average 18.1 LPM (4.8GPM) per sprinkler): 16

Pump Quick Specs

Waterax Mark3:

Engine: 2 Stroke 10hp

Fuel Mixture: 50:1 unless otherwise stated

Pump: 371 LPM (98 GPM), 2620 kPa (380 psi)

Max Head Distance: 268m (878’)

Max Distance (Rule of Thumb): 1km (3300’), then add a relay pump

Weight: 26.4 kg (58.3lb)

Required Setup Equipment: Pump, Fuel, Fuel Hose, Suction Hose with Foot Valve Strainer, Discharge Check Valve, Discharge Hose, Pump Kit

Estimated Sprinkler Quantity (average 18.1 LPM (4.8GPM) per sprinkler): 20

Pump Quick Specs

Waterax BB4:

Engine: 4 Stroke 18 hp

Fuel Mixture: Straight Gas

Pump: 394 LPM (104 GPM), 3033 kPa (440 psi)

Max Head Distance: 310m (1016’)

Max Distance (Rule of Thumb): 1.3km (4265’), then add a relay pump

Weight: 76 kg (168lb)

Required Setup Equipment: Pump, Fuel, Fuel Hose, Suction Hose with Foot Valve Strainer, Discharge Check Valve, Discharge Hose, Pump Kit

Estimated Sprinkler Quantity (average 18.1 LPM (4.8 GPM) per Sprinkler): 22

Pump Quick Specs

Waterax B2X:

Engine: 4 Stroke 23 hp

Fuel Mixture: Straight Gas

Pump: 1090 LPM (288 GPM), 1380 kPa (200 psi)

Max Head: 141m (462 ft)

Max Distance (Rule of Thumb): 65mm hose is 300m (985 ft), then add a relay pump

Weight: 79 kg (175lbs)

Required Setup Equipment: Pump, Fuel, Fuel Hose, Suction Hose with Strainer, Discharge Hose and Pump Kit

Estimated Sprinkler Quantity (average 18.1 LPM or (4.8 GPM) per sprinkler): 45

Pump Quick Specs

CET volume pump:

Engine: 4 Stroke 23 hp

Fuel Mixture: Straight Gas

Pump: 2600 LPM (650 GPM), and 805 kPa (115 PSI) Maximums. 4" inlet with Dual 2 ½" outlets.

Max Head: 82m (270')

Pumping rate: 1720 LPM @ 175 kPa (430 gpm @ 25PSI)

1240 LPM @350 kPa (310 gpm @ 50PSI)

440 LPM @ 700 kPa (110 gpm @100PSI)

Weight: 83 kg (182 lbs)

Required Setup Equipment: Pump, Fuel, Fuel Hose, Suction Hose with Strainer, Discharge Hose and Pump Kit

Estimated Sprinkler Quantity (average 18.1 LPM or (4.8 GPM) per sprinkler): 80

2 Stroke Fuel Mixing Chart

Metric Mix (ml of oil per litre of gas)			
Mix Ratio to 1	5 Litre	10 Litre	20 Litre
20	250 ml	500 ml	1000 ml
30	167 ml	333 ml	667 ml
32	156 ml	313 ml	625 ml
40	125 ml	250 ml	500 ml
45	111 ml	222 ml	444 ml
50	100 ml	200 ml	400 ml
60	83 ml	167 ml	333 ml
80	63 ml	125 ml	250 ml
100	50 ml	100 ml	200 ml

When in doubt of mixture, use 50:1

If the engine has a *dipstick*, it is a 4 stroke and requires straight gas.

Pump Troubleshooting Guide

Pump Doesn’t Start

(Remember: Fuel, Air, Ignition)

Issue	Possible Cause	Remedy
Pump Doesn't Start	Out of Fuel	Refill Fuel
Pump Doesn't Start	Fuel Air Vent Not Open	Open Vent Slowly
Pump Doesn't Start	Overspeed/Kill Switch in Off Position	Push Mechanical Switch Back In
Pump Doesn't Start	Dirty Air Filter	Clean Air Filter
Pump Doesn't Start	Air Leak in Fuel Hose	Replace Fuel Hose
Pump Doesn't Start	Dirty Fuel Filter	Replace Fuel Hose
Pump Doesn't Start	Loose Spark Plug Cap	Ensure Cap is Securely on
Pump Doesn't Start	Fouled Spark Plug	Replace Spark Plug

These are to be checked after the normal starting procedure has been tried at least twice.

Pump Troubleshooting Guide

Pump Loses Prime

Issue	Possible Cause	Remedy
Pump loses prime	Air leak on suction	Repair leaks (tighten, replace), ensure strainer is completely under water
Pump loses prime, air trapped in suction hose	Portion of hose is higher than pump	Lower hose or raise pump
Pump loses prime	Blocked or restricted intake	Remove blockage, ensure strainer is not in mud
Pump loses prime	Pump too high from water source	Lower pump (max head lift 15')

No Pressure

Issue	Possible Cause	Remedy
No pressure	Suction hose too small	Replace with larger diameter hose
No pressure	Blockage on either intake or discharge	Remove blockage, check impeller
No pressure	Open/free flowing discharge or ruptured hose	Close discharge, replace hose
No pressure, pump struggling	Hose Run Too Long/Pump Faulty	Ensure hose length is within spec, replace pump

Water Supply

Pressurized Water Source (Hydrant):

- Use for filling trucks
- Do not use for sprinkler systems (relies on power)
- Very limited reserves
- Can be used to fill portable tanks
- Use 65mm (2-1/2”) connections with a gate valve

Static Water Source (Natural):

- Ensure accessibility (filling or drafting)
- Requires a pump
- Length of hose needed
- Amount of storage
- May need to dam up to build capacity
- Ensure pump is on a solid base, tie off pump to shore anchor

Heavy Equipment Operation

- Clear communication with operator
    - Establish hand signals prior to starting work
- Stay well away from operating equipment
    - 2.5x the height of the tallest trees
- Remain visible
- DO NOT APPROACH without operator's attention and signal before approaching
- Assume they cannot see you

Controlled Ignition

- Must be approved by IC
- Only performed by trained personnel
- Ensure strips are of manageable size
- **DO NOT** trap others
- Timing and communication are key
- Only to be used as a last resort

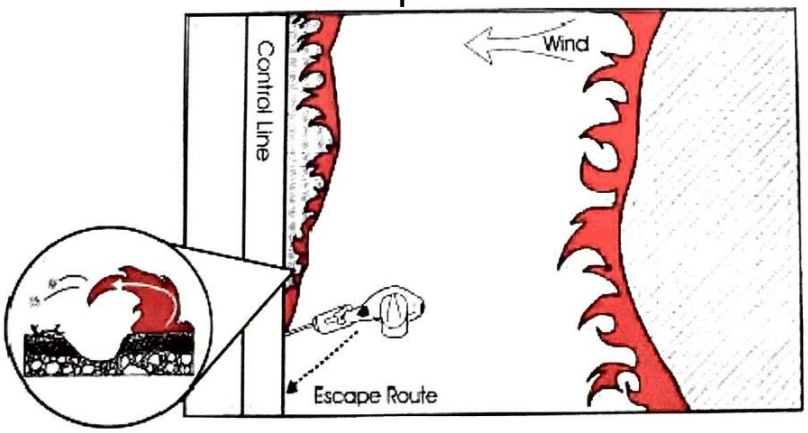
Ground Ignition Patterns

Backfiring: A form of indirect attack where extensive fire is set along the inner edge of a control line or natural barrier. (large scale)

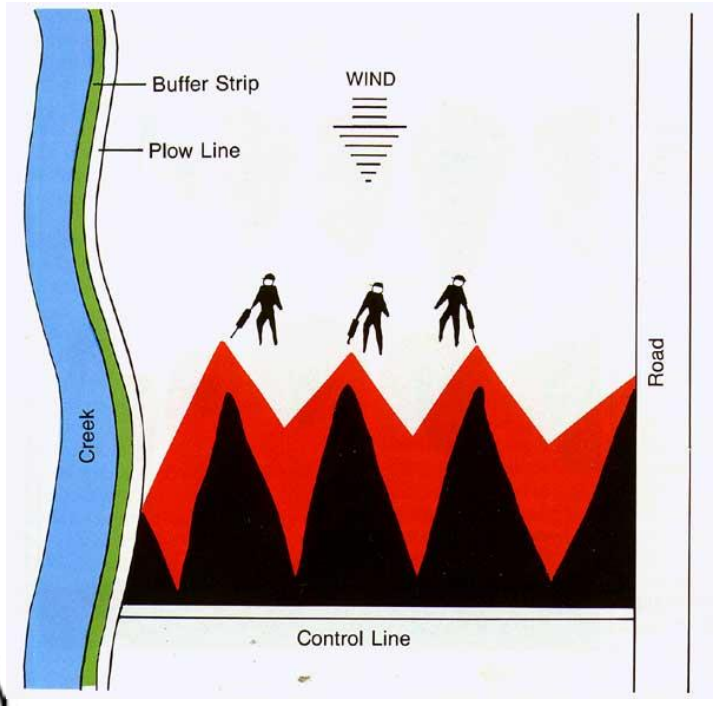
Burnout: A fire suppression operation where fire is set along the inside edge of a control line or natural barrier. (smaller scale)

1. Strip ignition

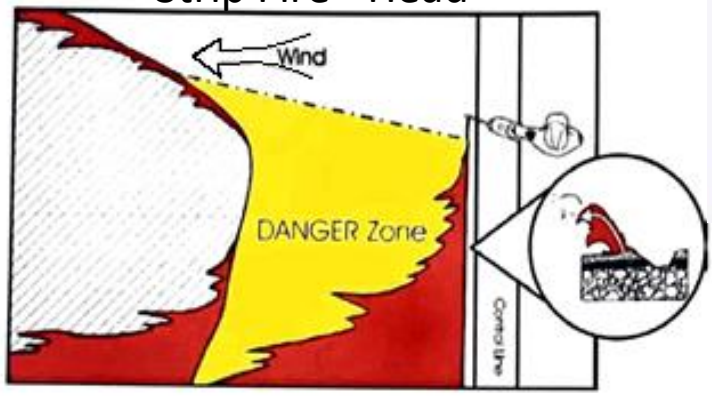
Strip Fire - Back



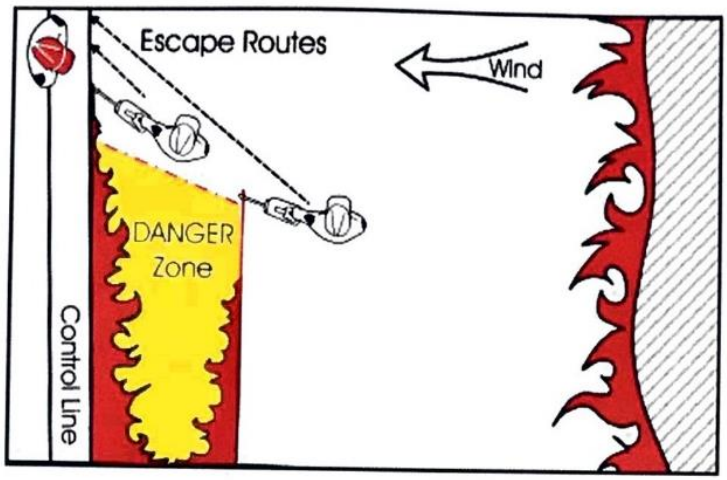
Strip Fire - Flank



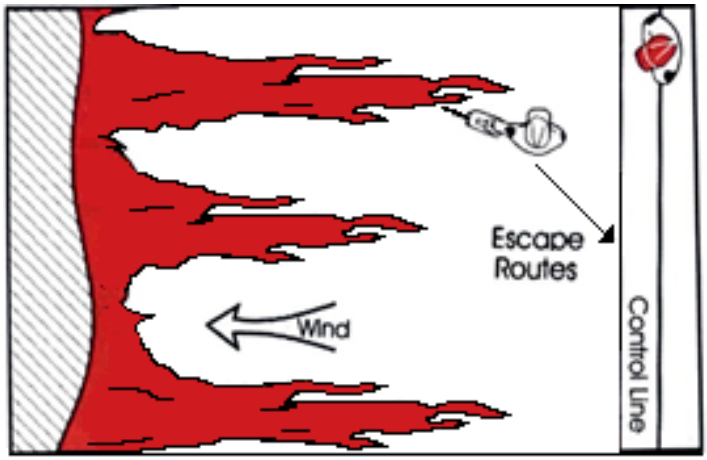
Strip Fire - Head



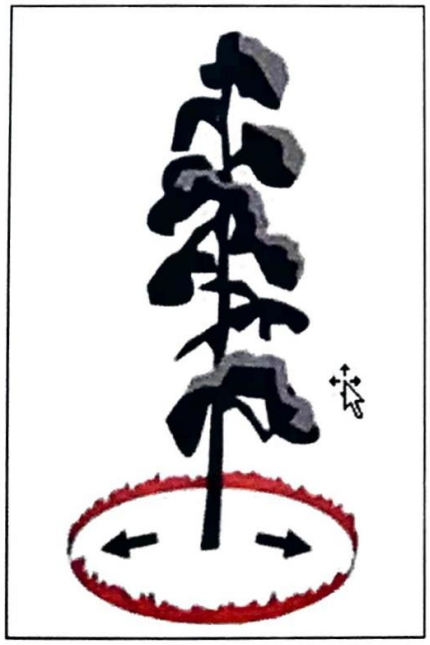
Multiple Strip Firing - Back



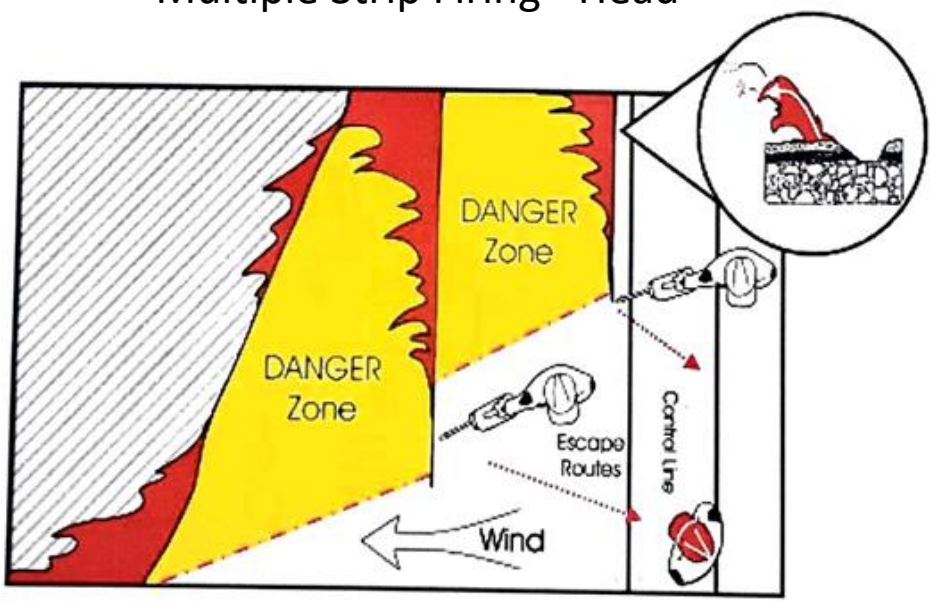
Multiple Strip Firing - Flank



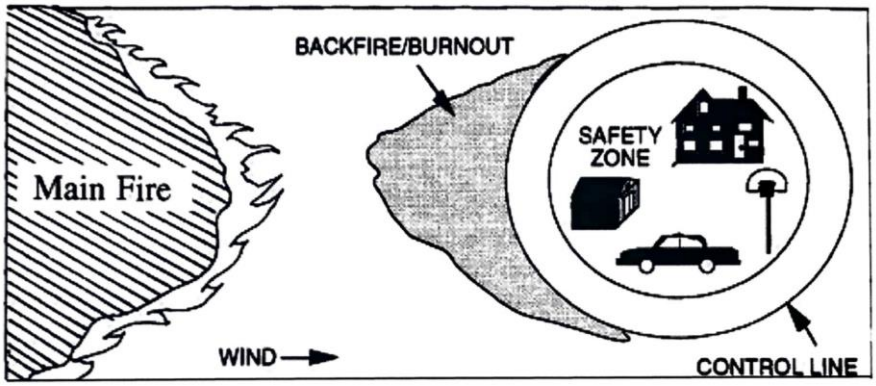
Bole Firing



Multiple Strip Firing - Head

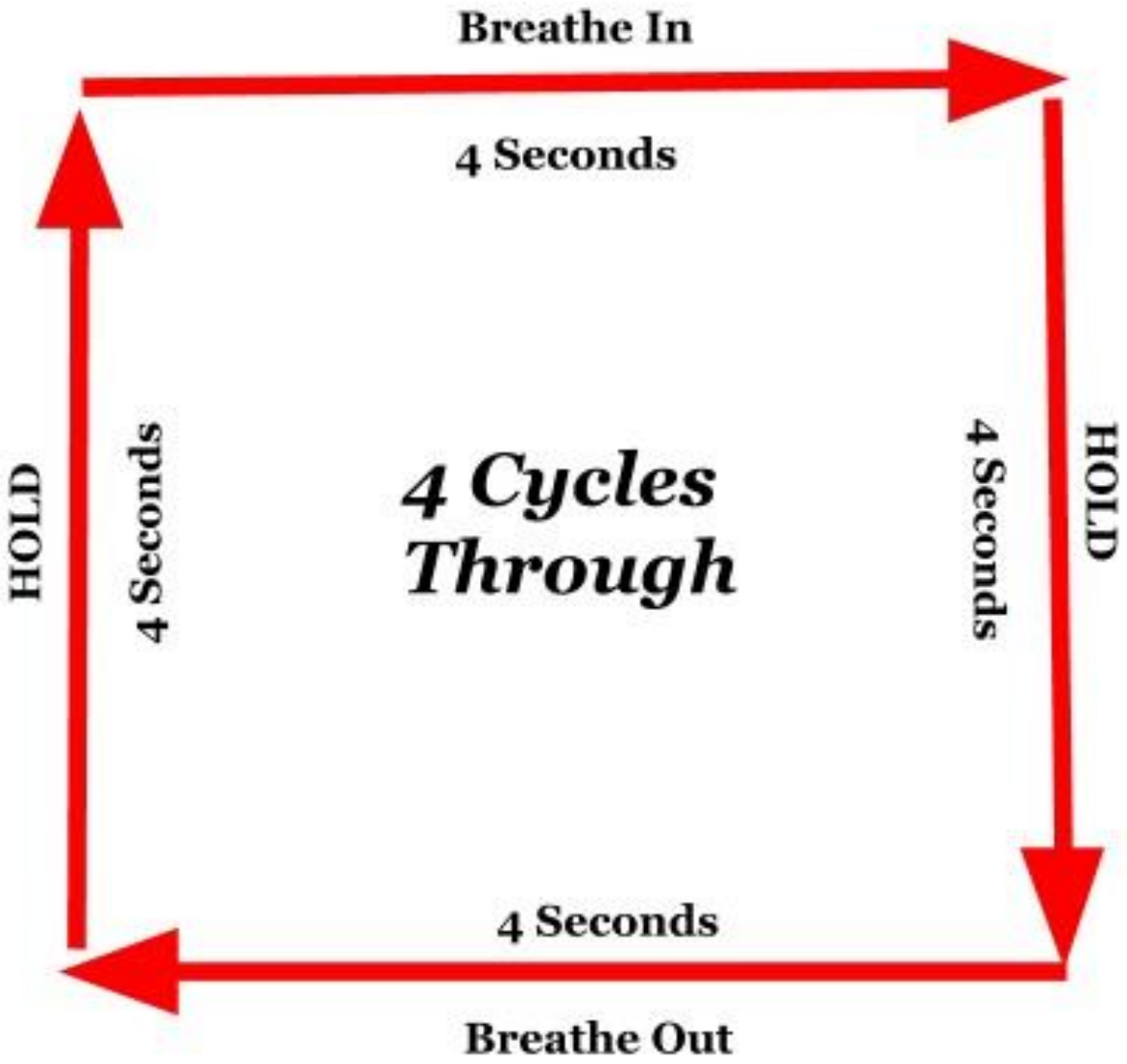


Ring Firing



Tactical Breathing or Box Breathing

This can be used to slow your heart and breathing rate down in a stressful situation. This will give you a chance to clear your thoughts and be able to re-engage with the task at hand.



Managing a Firefighter Mayday Call

Depending on size and complexity of the incident, the responsibility of managing the mayday call is the Incident Commander or Division Supervisors, whichever is closer to tactical level operations. In their absences, the acknowledging leader must manage the mayday call.

1. If you hear a mayday, you must answer it.
2. Clear the channel, all non-mayday communications must switch to a different channel.
3. Ask the person **L.U.N.A.R. and write it down.**

Location of firefighter or crew in need of assistance.

Unit number of firefighter or crew in need of assistance.

Name of firefighter calling the mayday.

Assignment of firefighter or crew calling Mayday.

Resources required to render assistance to those calling Mayday.

4. Inform your supervisor immediately.
5. Make a plan based off of gathered intel. Follow **PACE** pg.5
6. Gather required resources to affect assistance.
7. Execute the plan.
8. Continually review the effectiveness of the plan and adjust accordingly. There may be rare occasions that it is not possible to provide aid.

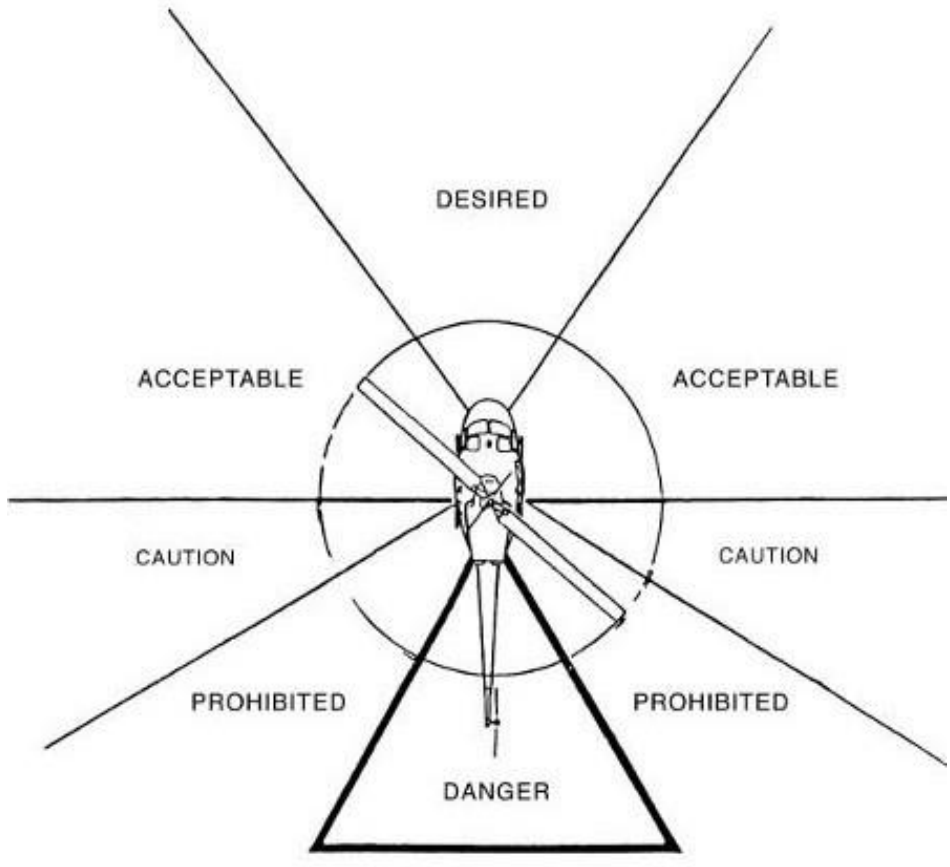
Aircraft Operation

Bird Dog Yelp Siren: Air drop is imminent

Bird Dog Wail Siren: All clear

If Caught in a Drop: Run perpendicular for cover (in or under a vehicle). If unable, lie face down with your head towards the drop. Throw your tools to the side of you, and keep your hands holding onto your helmet.

Approaching a Helicopter: Wait for helicopter to settle. **ONLY APPROACH FROM THE FRONT!** Wait for pilot's signal. Make sure nothing is loose on you or your equipment. Hold down helmet. Carry equipment at or below waist level.



Notes:

Notes:

Notes:

Acronyms

A Rep: Agency Representative

AAR: After Action Review

AEMA: Alberta Emergency Management Agency

AHIMT: All Hazards Incident Management Team

BUI: Build Up Index

CIFFC: Canadian Interagency Forest Fire Center

DC: Drought Code

DEMOB: Demobilization

DMC: Duff Moisture Code

DSR: Daily Severity Rating

ECC: Emergency Control Center

EOC: Emergency Operation Center

ESS: Emergency Social Services

FBAN: Fire Behaviour Analyst

FFMC: Fine Fuel Moisture Code

FPA: Fire Protection Area

FWI: Fire Weather Index

GIS: Geographic Information System

HEG: Heavy Equipment Group (Supervisor)

HFI: Head Fire Intensity

IA: Initial Action

IAP: Incident Action Plan

IC: Incident Command(er)

ICP: Incident Command Post

ICS: Incident Command System

IMT: Incident Management Team

IO: Information Officer

IRR: Initial Radio Report

ISI: Initial Spread Index

POC: Provincial Operations Center

PPE: Personal Protective Equipment

RAWS: Remote Automatic Weather Station

SOLE: State Of Local Emergency

SPU: Structure Protection Unit

UC: Unified Command

UC: Under Control

WMB: Wildfire Management Branch

WUI: Wildland Urban Interface

Key Terms

Aspect: Direction toward which a slope faces.

Anchors (LACES): An advantageous location, usually a barrier to fire spread, from which to start or finish construction of a control line. Used to minimize the chance of being flanked (or outflanked) by the fire while the line is being constructed.

Communications (LACES): Firefighters must be in constant communication with the other members of their crew either visually, verbally or by radio. Working alone or out of radio range or earshot is not allowed.

Conifer: cone-bearing trees with needles or scale-like leaves.

Creeping: a fire spreading slowly through the surface fuels, generally with a low flame front.

Crossover: The point at which the RH (Relative Humidity) is equal to the Temperature. A strong indicator of high or extreme burning conditions.

Crowning: a fire ascending into the crown of trees and continuously spreading from crown to crown.

Deciduous: tree and shrub species that lose their leaves annually.

Escape Routes (LACES): A pre-determined route that can be used by anyone in the event that fire begins an unexpected run that will jeopardize the safety of crews or anyone else on the fire line. The escape route will take everyone to another pre-determined location (safety zone).

Duff: the layer of loosely compacted, decaying debris underlaying the litter on the forest floor.

Fine Fuel: under 1 cm (.3”) in diameter.

Heavy Fuel: 7cm (2.75”) or larger in diameter.

ICS Form 204: informs Division and Group supervisors of incident assignments.

Impingement: the stage where the fire front makes contact. Either with fire or embers.

Incident Action Plan (IAP): is an organized course of events that addresses all phases of incident control within a specified time.

Interface: a condition where structures are part of the wildland but with a clear line of separation.

Intermix: a condition where structures are scattered throughout a wildland area with no clear line of separation.

Lookout (LACES): A competent and trusted person located in an advantageous position who has the responsibility of watching for potential fire problems and then relating them to their supervisor.

Medium Fuel: 1-7cm (.3”- 2.75”) in diameter.

Post-Impingement: the stage subsequent of the fire front passing.

Pre-Impingement: the stage prior to the fire front arriving.

Rate Of Spread (ROS/min): This is the rate of spread of a fire in meters/minutes depending on the fuel type and weather conditions you can find as low as 0.2/m a min in green M2 mixed wood or as high as 193m/min in O1b. (standing cured grass).

Red Flag Warning: Intended to provide situational awareness messaging for wildfire personnel and the public that a hazardous fire environment is developing, extreme fire behaviour is anticipated. (FFMC 92, BUI 103+ crossover sustained winds of 30km/h and or winds exceeding 50k/h).

Running: a fire rapidly spreading with a defined front or head.

Safety Zone (LACES): A location clear of fuels and of sufficient size to allow for safe shelter during the passage of the fire front.

Smoldering: a fire burning without visible flame and with no visual signs of spreading or advancing.

T-card: ICS form 219 Resource Status Card.

Torching/Candling: a tree or trees igniting and flaring up from the base to the top.

Weather Resources

Websites

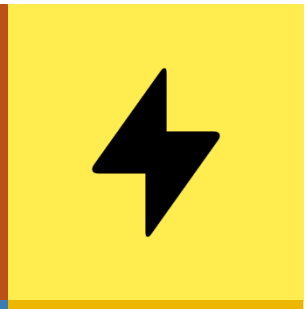
- firesmoke.ca
- spotwx.com
- agriculture.alberta.ca/acis/
- cwfis.cfs.nrcan.gc.ca
- https://www.alberta.ca/wildfire-status

Apps

Windy

Wildfire Info

Lightning



Weather Network

Global News Skytracker

Alberta Wildfire

Notes:

Notes:

Notes:

Notes:

Notes:

Notes:

Notes:

Beaufort Wind Scale Table

Force	Km/h	Descriptive Term	Effects Observed on Land
0	< 1	Calm	Smoke rises vertically.
1	1-5	Light Air	Direction of wind shown by smoke drift, but not wind vanes.
2	6-11	Light Breeze	Wind felt on face. Leaves rustle.
3	12-19	Gentle Breeze	Leaves and small twigs in constant motion. Wind extends light flag.
4	20-28	Moderate Breeze	Raises dust and loose paper. Small branches are moved.
5	29-38	Fresh Breeze	Small trees with leaves begin to sway. Crested wavelets form on inland waters.
6	39-49	Strong Breeze	Large branches in motion. Whistling heard in powerlines.
7	50-61	Near Gale	Whole trees in motion. Inconvenience felt in walking against wind.
8	62-74	Gale	Breaks twigs off trees. Walking into wind almost impossible.
9	75-88	Strong Gale	Slight structural damage occurs, ex. roofing shingles may become loose or blow off.
10	89-102	Storm	Trees uprooted. Considerable structural damage occurs.
11	103-117	Violent Storm	Widespread damage.
12	118-133	Hurricane	Severe widespread damage to vegetation and significant structural damage possible.

BRIEFING CHECKLIST

Situation

☐ Fire name, location, map orientation, other incidents in the area

☐ Terrain influences

☐ Fuel type and conditions

☐ Fire weather (previous, current, expected) (IAP 200a)

☐ Winds, RH, temperature

☐ Fire behaviour (previous, current, expected)

Mission

☐ Overall objectives and strategies (IAP 202)

☐ Specific tactical assignments (IAP 204)

☐ Contingency plans

☐ Medivac plan (personnel, transport options, contingency plans) (IAP 206)

Communications

☐ Communication plan (IAP 205)

Tactical, command, medical, air-to-ground channels

Cell phone numbers

Support/Services

☐ Other resources: available and working adjacent

☐ Logistics: transportation, supplies and equipment

Risk Management

☐ Identify known hazards and risks

☐ Identify control measure to mitigate hazards/reduce risk

(LACES)

☐ Identify trigger points for reevaluation operations

Questions or Concerns?