

# Quick Reaction Force (QRF) OPERATIONAL DOCTRINE



Coordinating Draft v2.3

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## DEDICATION

The harsh reality of today's Southern California wildfire environment requires an evolution in how wildfires are attacked. The Quick Reaction Force is the first-ever standing Aerial Task Force. An innovation in thought and in capability. It adapts a highly successful military concept and applies it to the hard lessons of the megafire era. The QRF is dedicated to everyone in the state of California striving to adapt to that new reality.

*Those who are possessed of a definitive body of doctrine and deeply rooted convictions based upon it, will be in a much better position to deal with the shifts and surprises of daily affairs, than those merely taking short views, and indulging their natural impulses as they are evoked by what they read from day to day.*

**Sir Winston Churchill**

## FORWARD – WHAT IS DOCTRINE?

Doctrine is the expression of the foundational framework, values, and principles that guide the planning and conduct of operations. It is authoritative, and at the same time flexible and adaptable to a given situation.

Understanding doctrine facilitates communication and creates a shared professional culture and approach to operations. The doctrine presented here provides an overarching view of how to use the Quick Reaction Force to its best effect. It does not prescribe policy or rules or dive into tactics, techniques, and procedures.

This document was authored by Mission-Centered Solutions, Inc., (MCS) Franktown, Colorado.



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# Section 1: A New Philosophy

## The QRF Aerial Task Force and the Era of Megafires

### THE QRF CONCEPT

In the military, the Quick Reaction Force (QRF) is an armed force capable of assembling and moving at speed to reinforce troops in contact with the enemy in order to:

- Retain the initiative
- Exploit an unexpected success
- Counter an unexpected reverse

The wildland firefighting QRF has the same goals – now against a megafire enemy that has proven itself far more lethal and destructive than historic wildfires. It does so with aircraft, intelligence, and supervision.

The wildland fire QRF is the prototype of a new kind of resource. A standing **Aerial Task Force**. The QRF is comprised of four aircraft – all night vision capable and a mobile retardant base:

- One aerial supervision/intelligence aircraft with an Aerial Task Force Leader (ATFL) leader fully qualified as an Air Tactical Group Supervisor (ATGS) and as a Helicopter Coordinator (HLCO) along with a qualified sensor operator
- One large (Type 1) Helitanker (1,000 gallon LHT)
- Two very large (Type 1) Helitankers (3,000 gallon VLHT)
- A mobile fire retardant base (MRB) and Multiple mobile helicopter re-fueling tenders
- Several Helicopter Managers (HEMG) and a Tech Specialist as a ground coordinator/liaison

## Section 1: A New Philosophy

The multi-helitanker QRF, with its organic intel and supervision capabilities, can assemble and move quickly, allowing an Incident Commander (IC) to deliver decisive suppression power during initial attack. In sustained attack mode, it has self-contained mobile retardant filling and fuel supplies. Forward-deployed retardant and fuel along with the very large helitankers' ability to hover-fill its tanks in only 90 seconds, gives the IC a much faster load and return cycle than fixed-wing air tankers. The use of retardant versus water provides a longer lasting suppressive effect, giving more options to firefighters on the ground.

The number one principle behind the use of the QRF is to keep fires small. Megafires, once an anomaly, are now business as usual in our state, both in northern and southern regions. There is nothing indicating this trend will change in the coming years. The question is – how will wildland firefighting adapt? How do we meet our objective of suppressing 95% of wildland fires at 10 acres or less? What can we do to prevent the remaining 5% from becoming megafires?

The QRF embodies a new way of thinking. It is not just enhanced aerial attack. It is aerial assault. It is an escalation of both aggression and force in the fight against wildfire.

While the concept of a standing *Aerial Task Force* may be new, the QRF is rooted in two quotes from the Interagency Standards for Fire & Fire Aviation Operations, known as the Redbook:

### *1. The purpose of fire suppression is to put the fire out.*

The concept of *let burn* or *managed* fire anywhere near high values at risk is obsolete. Fire potential for rapid, large growth is simply too high throughout the fire year in California.

### *2. Aggressive initial attack provides the Incident Commander maximum flexibility in suppression operations. Successful initial attack relies on speed and appropriate force. All aspects of fire suppression benefit from this philosophy.*

On high-potential fire growth days, leaders want to be proactive in spooling up and positioning aircraft ready to pounce at a moment's notice. The outdated mental model of thinking about aircraft after a fire has spotted over the line is now a recipe for disaster. In the words of one division chief, "By the time one of these small fires shows you what it can be... it's too late."

## WILDFIRE SUPPRESSION POWER

*Suppression Power is defined as the total amount of force that a wildland firefighting effort can apply at a given time in order to protect values at risk and/or contain uncontrolled wildfire.*

The intent of the QRF is to amass overwhelming **Wildfire Suppression Power** on initial attack and an intense, sustained attack into the first night of fires with high growth potential. All catastrophic wildfires – *Dixie, Camp, Woolsey, Thomas* – started as a small “postage stamp size” fire. ICs can use the QRF to take advantage of the *golden window of opportunity* to suppress a potential megafire while still in this incipient phase.

The impact of preventing even one large destructive fire using the QRF – saving lives, homes, critical infrastructure and natural resources – will far outweigh the financial costs of QRF availability and use for the entire fire year. Even when only comparing the direct large fire suppression costs paid by an agency to QRF hourly rates clearly justifies this new approach to aggressive aerial attack.

The QRF enables an IC to deliver fire retardant or water, any time, night or day, with precision and in sufficient quantity and speed to allow ground firefighters to achieve containment.

A task force of helitankers allows sustained concentration of *suppression power* onto the fire. This gives ICs the ability to hit early, hit fast, and hit hard with overwhelming suppression power. In sustained attack mode, they can also hit more often than using traditional fixed-wing air tankers. The QRF’s combined effect is far greater than the sum of its parts. It achieves synergy through its organic firefighting, intelligence, leadership, supervision, and logistics capabilities.

The exponential savings – both in lowering costs and preventing loss through effective use of aviation on initial attack – is well quantified and documented. The question is how to apply that at scale against potential fire growth in the megafire era? Southern California Edison (SCE) understood this potential return on investment of the *Aerial Task Force* concept and committed \$18 million dollars to fund the daily availability rate to make the QRF response possible anywhere in the fifteen counties of the SCE service area.

## WHAT CONDITIONS ARE DRIVING QRF INNOVATION?

The combined population of the QRF host counties of Los Angeles, Orange, and Ventura exceed one-third of the entire state of California. Wildland fire spread during extreme fire weather conditions has surpassed all historical models. Southern California fire seasons are most critical during late summer and fall months, when many federal aviation contracts are ending. Next Generation Air Tankers now have contracts and obligations outside of the United States. The Australian fire season begins ramping up just as our Santa Ana season starts.

Decades of experience demonstrate that water dropped from a helicopter is usually good for checking the fire spread for a short period of time, between 5 and 30 minutes, and must be quickly and closely followed up by extending hoses and with hand crews constructing control lines for final control.



## Section 1: A New Philosophy

The number of hand crews available throughout the state system has declined over the last several years by over fifty percent, and the majority of federal agency hotshot crews are not available during the most critical time of fire season in Southern California. As a result, there is often a significant delay before sufficient hand crews are in place to construct fire control lines where helicopter water drops have slowed fire spread.

In response to this reality, the QRF is an example of a **Total Mobility** philosophy. In other words, by employing an aerial task force, ICs have the capability to move, position, and utilize established resources quickly and nimbly to meet existing and anticipated fire protection needs throughout the fifteen counties and beyond when the need is greatest.

The use of long-term retardant by helitankers during the day and at night until hand crews arrive is critically important. Retardant slows the spread of fire for much longer periods of time than water drops alone. Each of these counties have developed their own wildland fire aerial suppression programs around the helicopter platform, with a goal of suppressing 95% of wildland fires to 10 acres or less.

Still, large destructive fires are occurring. Megafires are normal. When a wildland fire has the potential to exceed the capabilities of the initial attack organization, additional aircraft are needed to reinforce. Competing priorities with multiple new fires create a faster draw down of resources with an already short supply of federal air tankers. Per federal regulations, air tankers cannot drop 30 minutes after sunset and they are limited to 8 hours of flight time per day. It is here that a rapid and sustained response by an aerial task force can have a significant impact containing large fire growth. Fires that have a high probability to keep spreading into darkness, can now be suppressed with water and retardant throughout the night. In addition, QRF supports both Federal and State fixed wing air tankers by reducing draw down of critical resource needs during high initial attack periods.

Helicopter aerial fire retardant application at night is an entirely new capability. In the late 1970s and early 1980s, the US Forest Service (USFS) contracted a very small number of 350-gallon capacity firefighting helicopters that were assigned to Southern California bases and that were equipped for night aerial water drop (not retardant) operations. Early generation night-vision-goggles did not provide the same level of visual acuity that modern goggles now provide. Maintaining pilot and crew currency became cost prohibitive. As a result, the USFS discontinued night aerial fire suppression using helicopters in the early 1980s.

The QRF program represents the first of its kind. A standing *Aerial Task Force* with large capacity fire retardant delivery and application from the air at night. Establishing a night HLCO/ATGS is also new. The concept of qualified aerial supervision, low level at night, will benefit both aviation and ground assets in improving safety, speeding effective tactical deployment, and reducing risk exposure.

For the first time in the history of wildland firefighting in the United States an IC can say “We are never *not* putting in line.”



# Section 2: Operational Principles

## Applying the QRF Operational Principles

### MISSION

The mission of the QRF is stated in simple terms: Deliver overwhelming *Wildfire Suppression Power* on initial attack and an intense, sustained attack into the first night of fires with high growth potential.

### OPERATIONAL PRIORITIES

The operational priorities have the following order:

1. The highest priority of the QRF is to help extinguish a new wildfire during initial attack.
2. The secondary priority of the QRF is sustained attack during the first night of a wildfire.
3. The third priority is to use the QRF *in extremis* on an established large fire if part of the fire is making an aggressive run and threatening extremely high values at risk.

### QRF, THE PRINCIPLE OF MASS, AND SUPPRESSION POWER

Does this mean the QRF is really just bigger, faster, higher-capacity helicopters? More mass?

It is not simply about adding more and more helicopters. Mass alone reaches a point of ineffectiveness. There are countless examples of hundreds of engines kegged up in staging areas, rendered useless because of physical, communications, and command bottlenecks. At a certain point, more becomes counter-productive.

The *Principle of Mass*, one of the classic nine principles of war, is about combining and massing effects and then concentrating those effects at the decisive place and time. In wildland firefighting, this is the

## Section 2: Operational Principles

concentration of *Suppression Power*, which refers to the amount of force available to impose one's will on the environment. It is the total amount of knockdown force that a wildland firefighting effort can apply at a given time in order to protect values at risk and/or contain uncontrolled wildfire.

To be effective, this force needs to be concentrated at a decisive place and time with sufficient speed, mass, and momentum to gain and maintain the initiative in a sustained attack against today's potential megafires.

As an aerial task force, the QRF is capable of the precision delivery of fire retardant or water, any time, night or day, in sufficient quantity and speed to allow ground firefighters time and space to exploit success and contain a section of a fire. The strength is in the package. The combination of mobility, suppression power and leadership produces a synergistic combined effect far greater than the sum of its parts.

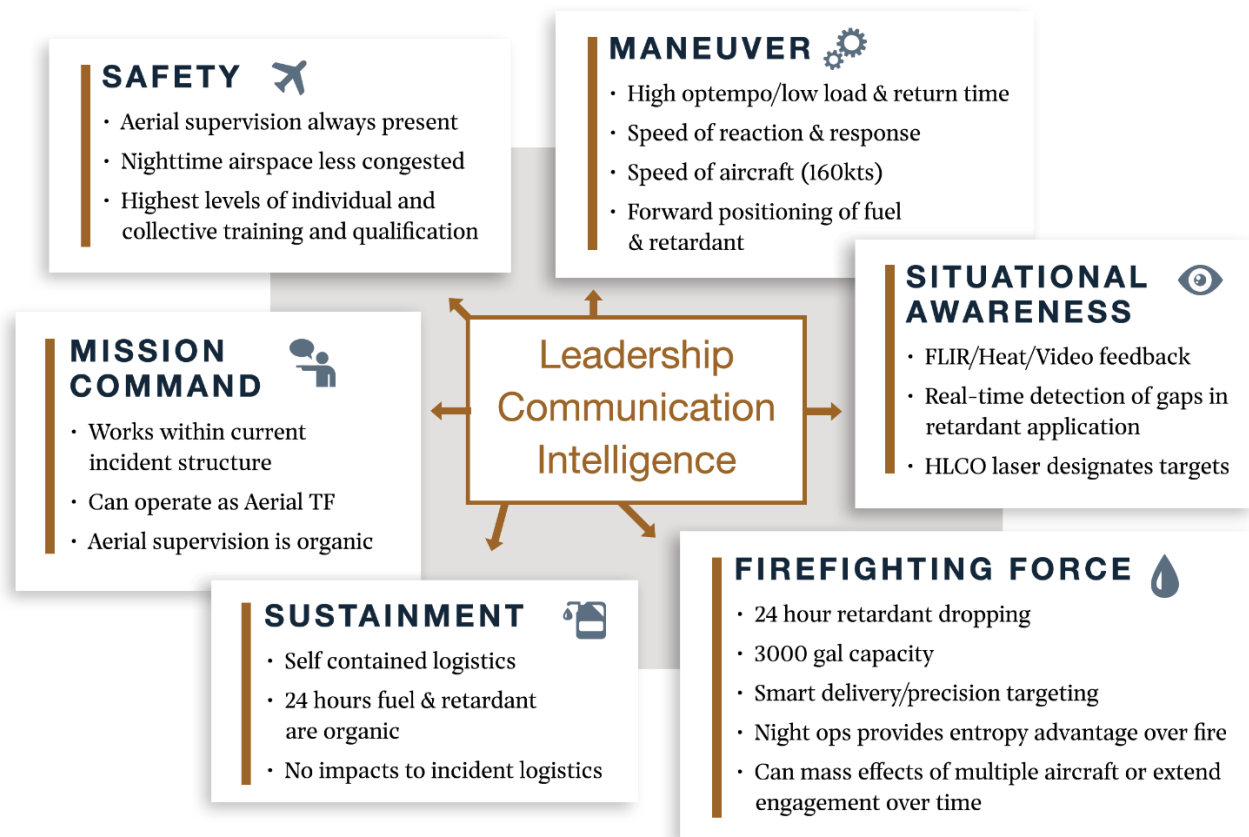
### EMPLOYING PRINCIPLES OF ACTION TO MAXIMIZE USE OF THE QRF

Effectively employing aerial task forces like the QRF requires a solid foundation in the **Operational Art**. Operational Art is defined as *the cognitive approach by commanders and staffs – using their skill, knowledge, experience, creativity, and judgment – to develop strategies, campaigns, and operations to organize and employ firefighting forces by integrating ends, ways, and means*.

Maximizing the effect of an aerial task force requires both the art and science of applying *Suppression Power* to wildland firefighting. The **Principles of Action** combine the art and science. Adapted from the *Principles of War* to wildland fire in the early 2000s, these principles apply to any action taken in a mission-oriented environment where competitive advantage, or **relative superiority**, is a decisive factor.

The megafire era requires a sea change in thinking – from attack to assault. The QRF allows an IC to be more aggressive without increasing overall risk through greater leverage of *suppression power*.

This graphic illustrates how the QRF combines its synergistic effects. It is both a complicated and a complex interchange of people, machines, processes, and systems – all functioning real-time in a high-risk environment.



### QRF Elements of Wildfire Suppression Power

While the QRF can conduct much of its own choreography and orchestration, the IC still directs the show. To do this requires the understanding of the *Principles of Action* and their application through strategies.

These principles serve as anchor points that shape the thinking and decision making of leaders in an environment dominated by volatility, uncertainty, complexity and ambiguity – also known as the *fog of war*.

The principles offer a framework that ensures that everyone shares common understanding, values, and doctrine – even during the fog of war. Shared meaning allows delegated decision making and operations to continue, even in the face of chaos, confusion, unexpected or novel barriers, communication failures, etc.

The following sections detail the *Principles of Action* and how the QRF supports their use by incident commanders.

**OBJECTIVE**

*All action should be directed toward the accomplishment of clearly defined results that directly support the senior leader's intent.*

The QRF enables a clear objective: Apply overwhelming suppression power as an aerial task force to assist ground firefighters in controlling wildfire.

**UNITY OF COMMAND**

*All forces operate under one responsible commander (or unified command) who has the authority to direct action to achieve a common end state.*

The QRF offers both unity of command along with a high degree of flexibility for an Incident Commander (IC):

- The QRF aerial supervision/intel platform through the sensors and their operator, ensures high-quality intelligence is being provided to the IC, contributing to a common operating picture.
- The qualified aerial supervisor of the QRF can assume ATGS or HLCO aerial supervision responsibilities for the incident if the IC desires. If aerial supervision for the incident is already in place, the QRF aerial supervisor will simply act as the Aerial Task Force Leader (ATFL) for the QRF helitankers and the QRF intel platform.
- The QRF, with organic fuel and retardant supply, allows the task force to conduct sustained attack (overnight for example) when there is no incident level aerial supervision or ground forces present.

## OFFENSE

*Acting with initiative in order to achieve a decisive result by being proactive.*

The research data and cost-benefit analyses on the use of firefighting aircraft during initial and extended attack are very clear. Effective use of aircraft during these times has a proven high return on investment. It is a myth that aircraft are too expensive to use on initial attack. Standby and availability costs, engine run ups and shut downs, and flight hour cost sticker shock are nothing compared to losing the tax base of a street of houses or the costs of a single large fire burning for several weeks. Add in the total human and financial cost of one megafire and the case is exponentially more compelling.

Together with the next principle – **Safety** – the QRF embodies the Firefighting Order *Fight fire aggressively, having provided for safety first*. It allows the option for an initial attack IC to apply overwhelming suppression power. The QRF offers the IC the ability to deliver a knockout punch in the early rounds of the fight.

Coupled with effective ground attack, the QRF enables a synergistic combination of air and ground assault to gain and maintain the initiative. The QRF can sustain an attack into the night, even during intervals where ground resources are unavailable to immediately follow up on retardant or water drops.

By dropping retardant at night, containment efforts can continue 24/7. Even if no ground crews are available, wetline construction allows progress to move forward.

## SAFETY

*Accomplishing the mission while acting aggressively to minimize the potential impact of hazards and risks.*

The QRF mitigates risks for an IC in a number of ways. QRF crewmembers have the highest levels of individual and collective training and qualifications. Aerial supervision is always present. QRF aerial supervisors at a minimum are fully qualified as HLCO, ATGS and Division Supervisors (DIVS). The sensor operator is continuously monitoring fire conditions and relaying situational awareness from high definition, low light, and thermal infrared sensors to ICs.

At night, the congested Southern California airspace is less crowded. Forward deployed retardant and fuel minimize the exposure of the aircraft during load and return flights. Day or night, the QRF enables “go direct” tactics on fire edges that are too hot for ground firefighters. With its large amount of water or retardant and its precision dropping ability, the QRF can create conditions where ground firefighters can more safely engage.

**FOCUS**

*The concentration of appropriate power at the decisive point to achieve maximum effect.*

Focus is achieved through the precision delivery of water or retardant. As an *Aerial Task Force*, QRF helitankers carry a mass of 7000 gallons, and through greater agility over fixed-wing tankers combined with advanced tanking system and computer-guided delivery controllers can concentrate that mass for greatest effect.

Real time infrared perimeter intel from the sensor operator and laser target designation from the qualified aerial supervisor ensures the concentration of that mass can continue through the night.

Operating as a task force allows sustained concentration of *suppression power* onto the fire.

**SPEED**

*Moving quickly enough to take advantage of opportunities that yield decisive results.*

The “Q” for *quick* in the QRF. To quote a founder of the QRF, *[On high fire potential days] it’s a very short step from success to disaster. The longer we wait, the less successful we’ll be. We have to hit it in that golden window, and if that window is missed, we have to plan for a thousand-acre fire that first night.*

The QRF can respond quickly through its increased readiness and higher aircraft speeds to support initial attack. When the mobile retardant base (MRB) is forward deployed, very large helitankers can hoverfill in 90 seconds. The lower load and return cycle times allow for quick turnarounds and sustained attack delivering intense suppression power for ground firefighters to exploit. The MRB sets up in pre-identified sites and is operational in less than two hours from when its equipment arrives.



## POSITIONING

*The movement, placement, and sustainment of resources to be able to be available at the decisive point and time.*

Positioning relates to focus as far as QRF aircraft being able to maneuver or position themselves to greater effect on initial attack than fixed-wing aircraft. The real impact of positioning lies in the ability for the QRF to rapidly respond anywhere within the Southern California Edison service area. If a sustained attack is required, the decision can be made to forward-deploy fuel tenders and the MRB to pre-identified sites. Hoverfilling helitankers close to the fire reduces the load and return cycle time and maintains the high operational tempo needed to achieve relative superiority through sustained attack.

## RESERVES

*Maintaining a pool of resources to sustain momentum or to reinforce engaged resources to exploit an opportunity.*

The QRF aircraft are hosted between three counties and can readily consolidate into the complete package, to operate as an aerial task force anywhere in the fifteen county SCE service area. The QRF provides ICs a means to reinforce ground firefighters as part of initial or extended sustained attack.

The task force has its own reserve of aircrew, fuel, and retardant, allowing it to rapidly transition into a sustained attack, into and through the night, without any loss of momentum.

## SIMPLICITY

*Clear, uncomplicated, and concise plans and orders stand the greatest chance of success under chaotic conditions.*

The use of an aerial task force for incident commanders is simple. Operationally, it fits into the existing command structure. If there is no aerial supervisor for the incident, the fully qualified QRF HLCO/ATGS can assume that role. If there is already incident aerial supervision in the form of a HELCO or ATGS, the QRF aerial supervisor can just act as the ATFL.

Being self-contained logistically the QRF's needs place virtually no demand on incident decision makers.

# Section 3: Proactive Strategies

## Employing the QRF to Enable Proactive Strategies

To deeply understand the impact of the QRF's unique characteristics and the power an aerial task force offers to incident decision makers, it is important to dive a little deeper into the concepts of competitive systems and the elements of *relative superiority and strategy*. In competition, there are five basic strategies. The acronym for these, listed in an order to be easy to remember, is **DRAW-D**.

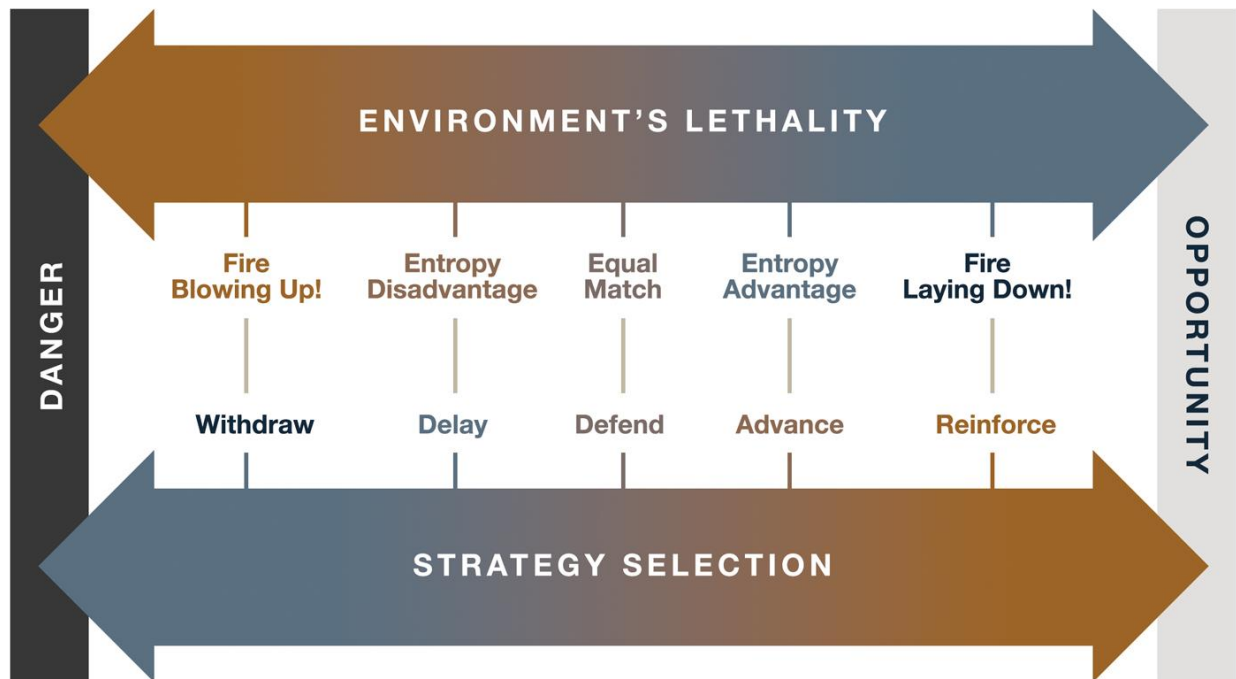
*Defend, Reinforce, Advance, Withdraw, Delay*

The point is to select strategies that eventually deliver more suppression power faster than a fire can grow and threaten values at risk.

Based on relative superiority between firefighting and fire growth, one selects the best strategy to either reach an objective, hold the position one has, buy time until a better opportunity presents itself, and so on. In the face of overwhelming environmental force, one must withdraw altogether and regroup.

In each case, the *Operational Art* means finding the best way to create synergy in the team to take advantage of a lull or other opportunity in fire activity.

The following graphic depicts the relationship between what the fire is doing and the appropriate strategy selection. The **DRAW-D strategies** are now laid out in an order of ability to apply suppression power relative to the intensity of the fire environment.



Following is a hypothetical example to demonstrate how an IC could use the QRF Aerial Task Force to achieve a more aggressive strategy selection. This example isn't meant to prescribe tactics, techniques, or procedures.

*As a fire goes into the first night, there could be unanticipated delays in crews getting out to a critical part of the fire. QRF helitankers, using night vision, can start to lay down retardant lines to Defend or Delay the fire until the crews arrive.*

*The sensor operator on the aerial supervision/intel ship can monitor the fire perimeter through infrared and notice any critical gaps in the retardant lines that would allow the fire to "squirt" through and escape containment. The fully qualified aerial supervisor can then notify the helitankers of the locations of the gaps and using a laser designator, can mark the gaps for the helitanker pilots, who can close them on subsequent drops.*

*The forward positioning of fuel and the mobile retardant base allows faster load and return cycles, providing the critical advantage for helitankers to Reinforce their lines and maintain relative superiority ahead of the fire activity.*

*Offensive action can continue all through the night. When crews are in place, the retardant line can still be holding, allowing crews to put in effective hand line and hose lays quickly. The combined discipline team can then Advance together using direct attack on the next section of uncontained fire edge.*