



XPRIZE
WILDFIRE



GORDON AND BETTY
MOORE
FOUNDATION

Competition Guidelines

Updated March 4, 2023

Version 2.1

COMPETITION GUIDELINES

XPRIZE Wildfire is governed by these Competition Guidelines. The Competition Guidelines summarize the high-level requirements and procedures of the Competition. These guidelines are based upon extensive research and consultation with fire management professionals, fire ecologist, emergency and disaster managers, forest ecologist, testing design experts and researchers across a wide array of relevant fields.

XPRIZE may revise these Guidelines at any time during the course of the Competition to provide additional information or to improve the quality of the Competition. Unanticipated issues that arise may require modifications to these Guidelines. XPRIZE reserves the right to revise these Guidelines as it, in its sole discretion, deems necessary. All **registered teams** will be notified of revisions in a timely manner. Official updates will be communicated to team leaders by email.

For the most updated version of the Guidelines, check xprize.org/wildfire/guidelines.

Further details concerning the operation of the Competition, such as exact dates and locations of events, specific technical thresholds for performance testing, and operational information will be released in the **Rules & Regulations** for Track A and Track B, and other documents that are forthcoming throughout the Competition.

NOTE: **Bolded** items are defined in the Glossary.

Summary of updates to Guidelines:

- [As of version 2.1, March 4, 2024]
 - Revised Track A Competition Details:
 - Registration for Track A closed on January 31, 2024. *Updated in sections 3.2, 3.4, and 3.5.*
 - Discretionary Late Registration will conclude February 2025. *Updated in section 3.2.*
 - Revised Track B Competition Details:
 - Qualifying Technical Submission deadline extended to Wednesday, May 1, 2024. *Updated in sections 3.2 and 3.5.*
 - Forward Deployment summary added. *Updated in section 3.5.*
 - Registration for Track B now closes on March 31, 2024; \$500 registration fee retained. *Updated in sections 3.2, 3.4, and 3.5.*
 - Discretionary Late Registration will conclude January 2025. *Updated in section 3.2.*
- [As of version 2.0, October 2, 2023]

- Revised Track A Competition Details:
 - Competition format revised to specify space-based observations, and defined altitude of “space.” *Updated in sections 3.1, 3.5, and Glossary.*
 - Track A description revised for clarity; replaced the term “Ground Station.” *Updated in sections 3.1, 3.5.*
 - Registration for Track A closes on October 31, 2023. *Updated in sections 3.2, 3.4, and 3.5.*
 - Discretionary Late Registration and the Qualifying Technical Submission due February 2024. *Updated in section 3.2.*
 - Qualified Teams announced April 2024. *Updated in section 3.2.*
 - Semifinals Testing format revised; now *Technical Verification*, April 2025. *Updated in section 3.5.*
 - Judging Criteria “Integrable with Systems” and “Scalability” revised for clarity of objectives. *Updated in section 3.5.*
 - Finals Testing will be held in August 2025. *Updated in section 3.2.*
- Revised Track B Competition Details:
 - Registration for Track B closes on January 31, 2024. *Updated in sections 3.2, 3.4, and 3.5.*
 - Discretionary Late Registration and the Qualifying Technical Submission now due April 2024. *Updated in section 3.2.*
 - Qualified Teams now announced August 2024. *Updated in section 3.2.*
 - Extreme Conditions Testing merged with Semifinals. *Updated in sections 3.2 and 3.5.*
 - Semifinals Testing now October 2025. *Updated in sections 3.2 and 3.5.*
 - Judging Criteria “Scalability” added for clarity of objectives. *Updated in section 3.5.*
 - Judging Criteria “Functionality in Complex Terrain” and “Fast and Universal Access to Data” revised for clarity of objectives. *Updated in section 3.5.*
 - Finals Testing now July 2026. *Updated in sections 3.2 and 3.5*
- Lockheed Martin Accurate Detection & Intelligence Bonus Prize:
 - This bonus prize will be awarded only to teams competing in Track B. *Updated in section 3.3.*
- [As of version 1.1, July 6, 2023]
 - Revised Registration Fee: Registration remains \$500 until close of Registration; Early Registration dates no longer apply. Discretionary Late Registration still applies. *Updated in sections 3.2 and 3.4.*

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1. COMPETITION OVERVIEW

The \$11 Million XPRIZE Wildfire is a 4-year Competition to innovate wildfire detection and rapid response technologies that will put an end to destructive wildfires.

Extreme Wildfire Events (EWEs) are on the rise. Globally, we see more fires that burn bigger, at a higher intensity, and spread out of control faster. These large and destructive wildfires are unleashing catastrophic consequences—from a growing economic burden and the loss of life and assets to the destruction of ecosystems. While only around 3% of all wildfires are extreme, they drive over 80% of total associated fire damages, and account for an increasing percentage of global greenhouse gas emissions.

Although wildfire can be tremendously destructive, it is also an important part of the global ecosystem. Wildfire is integral to the health and sustainability of forests as it clears dead vegetation and encourages new growth, and it is essential for the survival of certain plants, including the giant sequoia and Eucalyptus.

For over a century, the primary fire management approach in many places was to suppress any fire, in turn allowing more vegetation to accumulate on the ground, feeding extreme fires. This practice has begun to shift in recent years, but in light of global trends including a changing climate and the expanding **Wildland-Urban Interface (WUI)**, the risk of extreme wildfires will continue to heighten, increasingly outpacing present-day wildfire management capacity. Technical innovations combined with a renewed understanding of ecologically beneficial fire could give this field a crucial boost to its century-old practices.

Imagine a world where humanity and fire can sustainably and safely co-exist; where wildfires are **detected rapidly, accurately, and precisely**, allowing for the safe management of

environmentally beneficial fires and the swift suppression of destructive fires; where firefighting has transformed, ensuring the safety of firefighters, society, and ecosystems alike.

XPRIZE Wildfire will incentivize innovators to design and develop a wide range of novel firefighting technologies, in order to combat one of the most devastating global challenges of our time. The following **core problems** currently inhibit progress, and are the areas XPRIZE Wildfire is set to target.

> Time

Wildfire detection, response, and suppression can be too slow when it comes to destructive fires. Against a shrinking time window due to the changing climate and shifting population patterns, calls from local citizens remain the prime detection method when flames are visible. The present-day best-case average time from detection to suppression is 60 minutes, while in extreme conditions, fires take mere moments to sprawl out of control.

> Detection Accuracy & Precision

Early detection is a game changer for firefighting, but current capabilities are inaccurate or not precise enough, driving delays in strategy and response. From space, a hot pixel represents 1km² and the **false positive** rate can reach 40%, inhibiting the reliability of observations and delaying action. Closer to the ground, planes cannot roam the sky 24/7 and ground detection is limited in coverage area. All detection methods are challenged by certain environmental conditions, while live fire behavior intelligence is unavailable to global fire managers at large.

> Accessibility

Wildfires can start in hard-to-reach areas, while current ground vehicles are limited to 40% slopes and aerial vehicles are limited by weather conditions, time of day, and environmental and fire conditions. In terms of the fire behavior, for a flame of 1.2m (4ft.) in height, direct ground attack (control and suppression activities) cannot continue with hand tools alone, and at 2.4m (8ft.) in height, flames are too high and intense for an aerial attack.

> Siloed, Fragmented Field

Firefighting's building blocks—detection, response, and suppression—are split across many actors and are insufficiently coordinated and integrated. Innovators tend to work on one piece of the puzzle, and often, due to investment concerns, capabilities are developed to serve many, at times competing, priorities. All while fire managers are slow to see innovation incorporated.

> Operability in Extreme Weather

Climate-change-induced weather leads to more extreme fires that spread faster, making the current way of detecting, responding to fires, and delivering suppression materials or other fire attack maneuvers more challenging and increasingly obsolete.

> Global Availability

Even when the technology exists, it can be costly and out of reach of many countries and communities, as is the case with supertanker planes, satellite-based remote sensing (there is particular interest in the potential of Low-Earth Orbit (LEO) Satellites in providing high resolution global observation), and even having a local firefighting unit.

2. HEALTH, SAFETY, AND ENVIRONMENT

Developing and testing novel wildfire management technology is inherently dangerous. Safety is our top priority. XPRIZE works with an array of best-in-class professionals to design testing scenarios that achieve the appropriate balance of challenging and safe. Working closely with certified Fire Managers, we will take every precaution to ensure the safety of all participants, judges, and the public during testing. Safety controls stand as the most critical aspect of all testing rounds of this Competition.

XPRIZE acknowledges that there is a possibility that something does not go according to plan, and we develop comprehensive risk mitigation plans in partnership with the relevant testing partners and landowners. Although we believe solutions can come from anywhere, prior to advancing to later stages in the Competition, teams will be assessed on their safety planning and understanding of fire management and the inherent risks. Due to the nature of XPRIZE Wildfire testing, Teams may be required to obtain Commercial General Liability insurance coverage. Teams should refer to Exhibit C of the **Competitor Agreement** for details on competition insurance requirements.

To minimize the impact of the Competition on the environment, Competition entries must minimize environmental harm and ensure safety of participants and surrounding communities. All teams must comply with the following requirements:

- Teams must research and obtain any necessary permits for operation in the Competition Area as it pertains to their tested solution. XPRIZE will collaborate with teams in this activity.
- Teams will comply with all relevant environmental, health, and safety regulations.
- Teams must ensure compliance with NFPA Wildfire Codes and Standards.
- Teams may not employ, influence, or harm any form of life in their approaches to the challenge, and should make every effort to avoid detrimental effects on all conservation values.
- Teams must ensure that solutions are fully functional and will not pose a risk to other competitors, judges, safety personnel, or observers.
- Teams must recover equipment and supplies that are deployed within the **Competition Area**. Any disposable portions of the system must be declared and accepted by Judges as causing no harm prior to deployment in the Competition Area.

Additional details will be provided in the Rules & Regulations for each track. XPRIZE reserves the right to adjust the Competition Guidelines and Rules & Regulations based on the latest scientific

and legal information available at the time to ensure personal and environmental safety. XPRIZE will make all final determinations on safe and acceptable operating conditions for Competition operations. XPRIZE reserves the right to disqualify teams who are found to be operating in an unsafe or unethical manner, whether at official testing sites or at their own facilities.

3. COMPETITION STRUCTURE

3.1 COMPETITION TRACKS

Across two Competition tracks, designed to support near and long-term impact goals and address the core problems, competing teams will innovate across all aspects of firefighting—from detection and characterization of the fire to autonomous wildfire response solutions and suppression materials. The Competition tracks will individually and jointly transform how wildfires are managed and fought. Teams may register to compete in one or both tracks.

Track A: Space-Based Wildfire Detection and Intelligence

In the Space-Based Wildfire Detection & Intelligence track, teams will have one minute to accurately detect all fires across a landscape larger than entire states or countries, and 10 minutes to precisely characterize and report data with the least false positives to decision-makers on the ground.

Track B: Autonomous Wildfire Response

In the Autonomous Wildfire Response track, teams have 10 minutes to autonomously detect and suppress a **high-risk fire** in a 1,000 km², **environmentally challenging** area, leaving any **decoy fires** untouched.

Lockheed Martin Accurate Detection & Intelligence Bonus Prize

Teams in Track B: Autonomous Wildfire Response may also compete for the **Lockheed Martin Accurate Detection & Intelligence Bonus Prize**, which will complement the goals of the main Competition by incentivizing breakthroughs in rapid, precise, and accurate detection of wildfires. Refer to section 3.3, Prizes, for details about all **prize purses**.

3.2 COMPETITION MILESTONES

Competition Milestones may be subject to change. The following tables are intended to provide an overview of major Competition milestones. All teams, especially those that choose to compete in both tracks, are reminded to closely monitor Competition timelines.

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The Competition tracks will run in parallel, with the timeline of the Space-Based Wildfire Detection & Intelligence Track occurring at a faster pace than that of the Autonomous Wildfire Response Track. Space-Based Wildfire Detection & Intelligence will consist of three (3) rounds over 22 months. Autonomous Wildfire Response will consist of three (3) rounds over 36-42 months.

Following deliberation with the **Judging Panel**, XPRIZE will directly notify all teams who are selected to advance to each subsequent stage of the Competition.

An additional 12 months will be devoted to amplifying the impacts of XPRIZE Wildfire and ensuring that successful solutions are adopted by the stakeholders most in need of the resulting technologies.

Milestone Summary Table	
Space-Based Wildfire Detection & Intelligence	Autonomous Wildfire Response
<ul style="list-style-type: none"> • Team Registration • Round 1: Qualifying Technical Submission • Round 2: System Technical Verification • Round 3: Finals Testing • Award Ceremony • Scaling & Impact 	<ul style="list-style-type: none"> • Team Registration • Round 1: Qualifying Technical Submission • Round 2: Semifinals Testing • Round 3: Finals Testing • Award Ceremony • Scaling & Impact

Track A: Space-Based Wildfire Detection & Intelligence (April 2023 – August 2025)		
Date	Event	Details & Requirements
April 21, 2023	Official Competition Launch	Team Registration Opens, Competition Guidelines Released
April 21 - May 17, 2023	Competition Guidelines Public Comment Period	Comments may be sent to wildfire@xprize.org
April 21 - January 31, 2024	Registration Period	Registration Deadline: January 31, 2024 USD \$500 Signed Competitor Agreement required with payment (see section 3.4 Team Registration)
February 1, 2024	Qualifying Technical Submission Deadline	Detailed technical submission (see section 3.5 Competition Rounds)
April 2024	Qualified Teams Announced	Advancing teams will share a milestone prize purse (see section 3.3 Prize Purses)

Track A: Space-Based Wildfire Detection & Intelligence (April 2023 – August 2025)		
Date	Event	Details & Requirements
August 2024	Team Summit	In-person meetings to introduce teams to each other and foster collaboration opportunities
February 1, 2025	Discretionary Late Registration Closes	Late Registration Fee, USD \$2,000 See section 3.4 Team Registration for details
April 2025	Semifinals System Technical Verification	Detailed technical submission; instructions provided November 2024 (see section 3.5 Competition Rounds)
May 2025	Finalist Teams Announced	Advancing teams will share a milestone prize purse (see section 3.3 Prize Purses) Finals Testing location announced
August 2025	Finals Testing	Outdoor environment, independent Judging Panel (see section 3.5 Competition Rounds)
September 2025	Final Award Ceremony and Winners Announced	Winning team will be awarded the grand prize (see section 3.3 Prize Purses)
2025 - 2026	Post-Competition Scaling and Impact	

Track B: Autonomous Wildfire Response (April 2023 – July 2026)		
Date	Event	Details
April 21, 2023	Official Competition Launch	Team Registration Opens, Competition Guidelines Released
April 21 - May 17, 2023	Competition Guidelines Public Comment Period	Comments may be sent to wildfire@xprize.org
April 21 - March 31, 2024	Registration Period	Registration Deadline: March 31, USD \$500 Signed Competitor Agreement required with payment (see section 3.4 Team Registration)
April 1, 2024	Discretionary Late Registration Closes	Late Registration Fee, USD \$2,000 See section 3.4 Team Registration for details
May 1, 2024	Qualifying Technical Submission Deadline	Details provided in the Rules & Regulations

Track B: Autonomous Wildfire Response (April 2023 – July 2026)		
Date	Event	Details
July 2024	Qualified Teams Announced	
October 2024	Team Summit	In-person meetings to introduce teams to each other and foster collaboration opportunities
January 2025	Discretionary Late Registration Closes	Late Registration Fee, USD \$2,000 See section 3.4 Team Registration for details
March 2025	Semifinals System Technical Verification Deadline	Detailed technical submission (see section 3.5 Competition Rounds)
June 2025	Semifinalist Teams Announced	Advancing teams will share a milestone prize purse (see section 3.4 Team Registration)
October 2025	Semifinals Testing	Outdoor testing environment, independent Judging Panel (see section 3.5 Competition Rounds)
December 2025	Finalist Teams Announced	Advancing teams will share a milestone prize purse (see section 3.3 Prize Purses)
February 2026	Finals System Technical Verification Deadline	Detailed technical submission (see section 3.5 Competition Rounds)
July 2026	Finals Testing	Outdoor testing environment, independent Judging Panel (see section 3.5 Competition Rounds)
August 2026	Final Award Ceremony and Winners Announced	Winning team will be awarded the grand prize (see section 3.3 Prize Purses) Lockheed Martin Accurate Detection & Intelligence Bonus Prize Awarded
2026 - 2027	Post-Competition Scaling and Impact	

3.3 PRIZE PURSES

The XPRIZE Wildfire Prize Purse totals USD \$11,000,000 and is divided as follows. All prize monies are listed in US Dollars.

Grand Prize

A grand prize purse totaling USD \$7,000,000 will be awarded across the two Competition tracks. The First Place Team in each track will receive USD \$3,500,000.

Milestone Prizes

A milestone prize purse totaling \$3,000,000 will be awarded incrementally across the two Competition tracks, with \$1,500,000 allocated to each track. Milestone prizes will be awarded to teams that reach key Competition milestones, according to the Judging Criteria.

In the Space-Based Wildfire Detection & Intelligence Track, there are two milestone prizes. Teams that advance to the Technical Verification Round will share a milestone prize purse of \$750,000. Teams that advance to the Final Round will share a milestone prize purse of \$750,000.

In the Autonomous Wildfire Response track, there are two milestone prizes. Teams that advance to **Semifinals Testing** will share a milestone prize purse of \$750,000. Teams that advance to the Final Round will share a milestone prize purse of \$750,000.

Lockheed Martin Accurate Detection & Intelligence Bonus Prize

A Bonus Prize totaling USD \$1,000,000 will be awarded to one or more eligible teams participating in Track B: Autonomous Wildfire Response whose Competition entries successfully demonstrate **Accurate, Precise, and Rapid Detection**.

Further details will be provided in the Rules and Regulations.

3.4 TEAM REGISTRATION

Taking part in an XPRIZE Competition is an exciting and challenging journey that requires a significant commitment of time, expertise, and resources. XPRIZE will organize the testing environments; however, each team will be responsible for the total costs of their participation in the Competition, including R&D, general operations, and travel, among other costs.

XPRIZE Competitions are driven by teams of innovative groups and individuals, comprising subject matter experts, enthusiasts, start-ups, student teams, amateurs, and all problem-solvers in between; a winning idea can come from anywhere.

Teams and individuals are encouraged to collaborate and combine skills during the Competition. Teams may recruit additional experts and are permitted to add new members to their team at any time throughout the Competition. Teams competing in XPRIZE Wildfire may include individuals with expertise in the fields listed in the sidebar, among others. Teams may also merge with other teams at any time during the Competition, especially to add technical and subject matter expertise to their roster. *Teams must notify XPRIZE 10 days before a merger.*

In the case of mergers, teams must determine which legal entity will remain in the Competition and assign one team leader. Additional details regarding team mergers are provided in the Competitor Agreement.

To support team collaboration, XPRIZE will host informational sessions and facilitate team meetings, and may suggest that teams merge to form a more robust or interdisciplinary team. These sessions will allow teams to get to know each other and receive important Competition updates. All **Interested Teams** are encouraged to join, but participation in these sessions is not mandatory.

How to Register a Team

To participate, all teams must first create a FREE account and log in to the [Prize Operations Platform \(POP\)](#). POP is an online platform through which teams will register for the Competition and complete all required activities. All teams must appoint a Team Leader, who will be responsible for maintaining communications with XPRIZE. Teams are expected to maintain their POP profiles throughout the Competition, ensuring their profile shows the most recent team information, including an active email address.

Teams may register to compete in either or both Tracks. Progress and success in one Track do not imply commensurate progress or success in the other, and vice versa, however, there may be synergy between tracks. To remain eligible to compete, teams must complete the registration form, submit a Competitor Agreement, and pay a registration fee by the appropriate Registration Deadlines. Teams must complete all required activities within each respective track throughout the duration of the Competition.

Teams may decide that they possess more than one idea and wish to submit multiple entries. Multiple Competition entries per track are permissible, provided that each entry represents a distinct technology approach, and is registered under a distinct Team, complete with its own team profile, description, and entry fee in the Prize Operations Platform. The

- Automation, UAVs (drones)
- Artificial Intelligence
- Chemical Engineering
- Climate Science
- Data Analytics
- Emergency & Disaster Management
- Fire Ecology
- Fire Science
- Fire Detection/Response
- Fire Equipment & Technology
- Forest Management
- Forest Health
- Forestry and Wildlife
- Machine Learning
- Material Science
- Mechanical Engineering
- Product Design
- Product Engineering
- Project Management
- Remote Sensing
- Research
- Robotics
- Risk Management
- Satellite Imagery
- Sensors
- Systems Integration Engineering
- Wildland Firefighting
- Wildfire Management and Prevention
- Wildland-Urban Interface
- *and many others*

capacity of multiple entries may NOT be added together for the purposes of wildfire detection and/or suppression. Please refer to the Competitor Agreement for more details.

As of the date of submission, each Team must own, or hold appropriate license rights to, all technologies, methods, resources, and Intellectual Property included in the Team's submission. Please refer to the Competitor Agreement for more details.

Any person or entity can participate in the Competition, no matter their citizenship or nationality, unless prohibited by US law – see [Sanctions Programs and Country Information | US Department of the Treasury](#). If a Team has a Team Member who is ordinarily resident in such destinations, it will be up to the team to obtain a license of authorization issued under U.S. Law.

Registration Submission

Each team will complete a Registration Submission. The Registration Submission activity will be assigned to teams in POP automatically upon creating a team profile. This submission will be used to obtain an initial landscape of competitors, and to support the facilitation of collaboration opportunities between teams. The aggregate information from these submissions may be shared to support team collaboration opportunities. The XPRIZE Wildfire Operations Team will not distribute specific details about any team without permission.

The Registration Submission will ask about the following:

- Team composition, i.e. number of expected team members
- Proposed solution focus areas, i.e. detection, intelligence, response, suppression delivery, suppression materials, etc.
- In what areas of technical or subject matter expertise is your team seeking support?
- Is your team open to collaboration opportunities?

Registration Submissions are due by the standard registration deadline, but it is recommended to complete the submission sooner. Completing the Registration Submission for a given track will allow access to subsequent activities within that track, especially Registration Fee payment and Competitor Agreement signature activities.

XPRIZE encourages teams to begin designing their technologies at the earliest opportunity in preparation for the Qualifying Rounds of their respective track(s).

Registration Fees

Creating an account in POP is free. Once the account is created, registration fees are required as a simple qualifier to ensure competitors can obtain the appropriate resources to fully compete in the prize. All fees collected go toward supporting post-prize efforts, including **Alumni Network** development and prize impact work (see section 3.7). Team Registration must take place by the registration deadlines below.

Registration Fee: USD \$500

Registration Deadlines:

- Space-Based Wildfire Detection & Intelligence: Extended to January 31, 2024
- Autonomous Wildfire Response: March 31, 2024

XPRIZE has sole discretion to register and qualify additional teams across both Tracks from the close of their respective registrations until the **Discretionary Late Registration** deadline (see section 3.2). Teams that register during this period must meet all preceding registration and submission requirements and pay a late registration fee of USD \$2,000. *XPRIZE strongly encourages teams to register before the regular registration deadline. There is no guarantee late registration will be granted to a team.* Potential teams should contact XPRIZE directly for more details.

Competitor Agreement

To be considered to advance to subsequent stages of the Competition, all registered teams are required to sign the Competitor Agreement to acknowledge the terms expected of teams upon entering the Competition. The Competitor Agreement is a contractual document that contains vital information detailing the requirements teams must meet to remain eligible for the Competition. Competitor Agreements will be reviewed and signed when a team makes their registration fee payment. Teams are encouraged to thoroughly review the Competitor Agreement before signing. The competitor agreement is available as a read-only version on the [POP Resources page](#).

3.5 COMPETITION ROUNDS

XPRIZE Wildfire runs across two tracks, each with its own timeline and milestones. The tracks will both entail multiple rounds of technical submissions, testing, and judging, which inform the selection of teams that will ultimately compete for the Finals Prize Purses at **Finals Testing**.

- **Space-Based Wildfire Detection & Intelligence** Finals Testing is scheduled for August 2025.
- **Autonomous Wildfire Response** Finals Testing is scheduled for July 2026.

Throughout the Competition, teams will be asked to submit technical submissions, video footage (where applicable), supplemental documentation, and technology prototypes that demonstrate teams' solutions in accordance with the Competition criteria. Team submissions will be reviewed by an independent Judging Panel, which is responsible for making the final decisions on advancing teams from one round of the Competition to the next. Team submissions will be assessed and scored in a way that upholds confidentiality as well as fair and equal consideration of all Competition criteria, without favoring one criterion

over another unless explicitly specified.

The following sections outline the structure of each Competition track by milestone. Refer to the Competition Milestone Reference Table for side-by-side comparison. Full details pertaining to all submission and testing rounds will be published in the Rules & Regulations for each track. Scoring methodologies, beyond any general terms in these Guidelines, will be detailed in the Rules & Regulations. Additional information will be provided to Registered Teams in supplemental documentation.

XPRIZE Wildfire will refer to competing teams that progress through the Competition using the following **team definitions**:

- **Interested Team:** A team or individual that is interested in participating in the Competition and has created a profile in the XPRIZE POP system.
- **Registration in Progress:** A team that has completed registration but has not yet paid the fee and signed the Competitor Agreement.
- **Registered Team:** A team that has paid the required registration fee, signed the Competitor Agreement, and is eligible to submit a Qualifying Submission for the Judging Panel's review.
- **Qualified Team:** A team that has been selected by the Judging Panel from the pool of Registered Teams based on the strength of their Qualifying Submission.
- **Semifinalist Team:** A team that has successfully completed the necessary technical submission and is approved by the Judging Panel to advance in the Competition.
- **Finalist Team:** A team that has successfully completed Semifinals Testing and is approved by the Judging Panel to attend Finals Testing.

Further details regarding testing procedures and requirements for both tracks will be released in the Rules & Regulations.

Track A: SPACE-BASED DETECTION & INTELLIGENCE



In the Space-Based Wildfire Detection & Intelligence track, teams will have one minute to accurately detect all fires across a landscape larger than entire states or countries, and 10 minutes to precisely characterize and report data with the least false positives to decision-makers on the ground.

- Observations (data) in this track will be obtained from **space** in real time, defined as altitude of at least 100 km.
- Competing teams are not required to own or deploy their own satellite or space-based platform.
- Teams may partner with existing space-based platforms or acquire third-party data.
- Testing will be conducted in an outdoor, open environment with variable natural weather conditions, and using prescribed fire.

Judging Criteria

For this track, the most important judging criteria, based on which the Grand Prize will be awarded, are the accuracy and precision of wildfire detection and intelligence across vast and remote areas in various conditions and challenging terrain. This will encompass speed, accuracy, quality, complexity/comprehensiveness, and actionability of observations. As well, teams will be required to demonstrate the ability to cost-effectively scale their solutions for global availability.

Additionally, other criteria that will be tested throughout the Competition include:

- **High-Resolution Detection:** Current fires visible from space are too large for effective response. Teams will demonstrate the ability to detect fires 10m² in size and smaller, toward 1m², while drastically cutting the false positives rate to 5%.
- **Live Fire Behavior Intelligence:** While critical to informing action, fire behavior cannot be measured accurately in real-time and is estimated on-site by wildland firefighters. Teams will generate a comprehensive characterization of fire behavior including perimeter, direction and rate of spread, and intensity in different parts of the fire.
- **Global and Continuous Coverage:** Teams' solutions will be able to detect and pinpoint a fire in a wide range of environmental conditions, including different biomes, through smoke and cloud, and in both day and night.
- **Fast and Universal Access to Data:** From detection, teams will have 10 minutes to analyze and securely transmit data to decision-makers on the ground at a **dispatch center** and an **incident command post**.
- **Integrable with Systems:** Teams' solutions ought to be used by those who need them most - firefighters, but the field is slow to incorporate innovation. Thus, solutions will be evaluated for technical compatibility with emergency services data systems.
- **Scalability:** Space was chosen as the target observation vantage for the opportunities it holds for sharing the technology globally. Teams will demonstrate the cost effectiveness of their solution.

Round 1: QUALIFYING TECHNICAL SUBMISSION (February 2024)

This round will call for written Technical Submissions that provide detailed information by which the capabilities and potential for success of teams will be evaluated.

Qualifying Technical Submissions will include details on team composition, technology design concepts and objectives, feasibility and safety assessments, and a work plan to implement the proposed technology, among other information. Detailed instructions and an outline of information required in the submission will be provided in the Rules & Regulations.

An independent Judging Panel will be assembled to evaluate team submissions and select Qualified Teams. Following Judging, XPRIZE will notify all teams of their status. Advancing teams will share a milestone prize purse of \$750,000.

Round 2: SEMIFINALS SYSTEM TECHNICAL VERIFICATION (April 2025)

In this round, teams will demonstrate the analytical capabilities of their proposed solutions. Team solutions will be evaluated via submissions including data, and written and video materials; there will not be outdoor testing in this round. Analytics will process a satellite training dataset and teams will submit their insights using their API.

Complete criteria and procedures will be released in the Rules & Regulations.

Following Judging, XPRIZE will notify all teams of their status. Teams that advance to the Final Round will share a milestone prize purse of \$750,000.

Round 3: FINALS TESTING (August 2025)

The Winning Team will accurately detect and precisely characterize all fires 10m² in size and smaller, toward 1m², within a vast and remote area, and report with the least false positives to decision-makers on the ground within 10 minutes.

In the Final Round, testing will be conducted in an outdoor, open environment with variable natural weather conditions, and using prescribed fire. Teams will use real-time observational data collected from space (altitude of 100 km) to analyze a designated landscape. Teams are not required to have their own space-based platform. Teams may partner with existing space-based platforms or acquire third-party data.

Complete testing criteria and procedures will be released in the Rules & Regulations, and the official testing location(s) (**Competition Area**) for Finals Testing will be disclosed to teams by XPRIZE at a date prior to testing.

Track B: AUTONOMOUS WILDFIRE RESPONSE



In the Autonomous Wildfire Response track, teams have 10 minutes to autonomously detect and suppress a high-risk fire in a 1,000 km², environmentally challenging area, leaving any decoy fires untouched.

- Teams should refer to the following as current best practices and/or standards:
 - [FAA standards](#), specifically, [for general guidance on operations inside U.S airspace, see Title 14 Chapter 1 Subchapter C](#)
 - [US Department of Agriculture, Forest Service, specification 5100-304d](#)
 - [EPA](#)
 - ([NFPA 1143](#) and [NFPA 1145](#))

Judging Criteria

For this track, the most important judging criteria, based on which the Grand Prize will be awarded, are **accuracy and time elapsed** from ignition to **full suppression** of a potentially destructive **incipient stage wildfire** and any subsequent spot fires, leaving any false positives untouched. This will encompass quick, accurate and precise detection as well as rapid response and full suppression.

Additional criteria that will be tested throughout the Competition include:

- **Fully Autonomous Integrated Solutions:** From detection to response and suppression, solutions' ability to operate autonomously will be tested. These autonomous systems must feature a safety requirement known as “Human-On-the-loop” autonomy. This means the solutions must be capable of operating successfully without human input during the test (participants may provide input when training their systems), although humans will be supervising the testing and can abort or override if problems arise.
- **Smart Detection:** The ability of solutions to autonomously recognize and not respond to decoy fires—simulating false positives such as water vapor, clouds, or low-intensity, non-moving fires.
- **Safety:** Teams' solutions must not introduce harm in their operation or delivery (i.e., by striking anyone with a drone or a dangerous suppression material delivery mechanism).

Additionally, the teams' solutions (particularly if they innovate with a new chemical suppressant), must be non-toxic, based on current globally-recognized NFPA standards ([NFPA 1143](#) and [NFPA 1145](#)) and EPA standards. Concerning Lithium Ion Batteries, teams may refer to [NFPA 855](#).

- **Functionality in High Winds:** Teams' solutions will be tested to assure ability to function at 30km/h (20mph) and evaluated for the ability to withstand even 100km/h (60 mph) winds, both in terms of ability to fly or operate in this environment, as well as ability to deliver suppression materials in these difficult wind conditions.
- **Functionality in Complex Terrain:** Teams' solutions will have to demonstrate the ability to function effectively in steep or otherwise difficult terrain.
- **Connectivity:** Firefighting operations comprise many moving pieces, making communications essential to success. Experience has shown that at times, connectivity is lost to the extent of paralyzing operations. Thus, teams must exhibit 2 types of connectivity in their systems for back-up.
- **Scalability:** Teams will demonstrate the cost effectiveness of their solution.

Logistical Forward Deployment for Operational Testing

Teams will be permitted to deploy technology in the testing area in advance of the allotted time for testing.

The logistics and regulations guiding this forward deployment, including the exact test site location and access details, will be shared with teams closer to the Round 2 and Round 3 testing periods. Teams will be given a pre-scheduled date and time for all of these activities.

Within reason and as defined by XPRIZE testing partners and any regulatory requirements limitations, XPRIZE intends to provide the time, information and logistical support needed for testing.

Round 1: QUALIFYING TECHNICAL SUBMISSION (May 2024)

This round will call for written Technical Submissions that provide detailed information by which the capabilities and potential for success of teams will be evaluated.

Qualifying Technical Submissions will include details on team composition, technology design concepts and objectives, feasibility and safety assessments, and a plan to implement the proposed technology, among other information. Detailed instructions and an outline of information required will be provided in the Qualifying Technical Submission document.

Teams will have the opportunity to indicate their specific requirements for the effective operational testing of the proposed solution in the QTS. Responses to questions in the QTS will support XPRIZE's understanding of each team's system operations.

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An independent Judging Panel will be assembled to evaluate team submissions and select Qualified Teams. Following Judging, XPRIZE will notify all teams of their status. Advancing teams will share a milestone prize purse of \$750,000.

Round 2: SEMIFINALS

System Technical Verification (April 2025)

Prior to Semifinals Testing, all Teams will be required to demonstrate they have made sufficient progress on their proposed technology to advance to testing. A **Technical Validation Submission** will be required of all teams and will include written entries and video materials where applicable. Complete instructions and requirements will be shared with Teams before the deadline, allowing sufficient preparation time.

Submissions will be evaluated by the Judging Panel, accounting for the criteria outlined above, as well as technical maturity, feasibility and safety, and the ability of the Team to meet the Competition timeline.

Following Judging, XPRIZE will notify all teams of their status. Teams that pass the Technical Validation will be eligible to participate in Semifinals Testing.

System Testing (October 2025)

System Testing will require teams to test in an outdoor, open environment with variable natural weather conditions and with prescribed fire. Teams will demonstrate and be evaluated on their solution's individual components' ability to detect, locate, navigate to, and suppress an incipient stage destructive wildfire.

Complete testing criteria and procedures will be released in the Rules & Regulations, and XPRIZE will disclose the official Semifinals testing location(s) (Competition Area) to Semifinalist teams at a date prior to testing.

Following Judging, XPRIZE will notify all teams of their status. Teams that advance from this round will share a milestone prize purse of USD \$750,000.

Round 3: FINALS

System Technical Verification (February 2026)

Prior to participating in Final Testing, teams will be required to submit materials to verify they are prepared to proceed to the final round of the Competition. The Finalist Technical Validation will include written entries, video materials where applicable, and a business plan requirement for teams to demonstrate the implementation of their complete system. Complete instructions and requirements will be shared with Teams before the deadline, allowing sufficient preparation time.

Submissions will be evaluated by the Judging Panel, accounting for the criteria outlined above, as well as technical maturity, feasibility and safety, and the ability of the Team to meet the Competition timeline.

Following Judging, XPRIZE will notify all teams of their status. Teams that pass the Technical Validation will be eligible to participate in Finals Testing.

System Testing (July 2026)

The winning team will have 10 minutes to autonomously detect and suppress a high-risk fire in a 1,000 km², environmentally challenging area, leaving any decoy fires untouched.

In this round, teams will be tested in an outdoor, open environment with variable natural weather conditions, and using prescribed fire. Teams must autonomously detect, locate, respond, and suppress a potentially destructive incipient stage wildfire within 10 minutes of detection, leaving any false positive and decoy fires untouched.

Complete testing criteria and procedures will be released in the Rules & Regulations, and the official testing location(s) (**Competition Area**) for Finals Testing will be disclosed to teams by XPRIZE at a date prior to testing, allowing sufficient time for teams to arrange travel.

3.6 WINNERS ANNOUNCEMENTS

Following Finals Testing in each track, the Judging Panel will convene to review and discuss the results and determine the winners of the Grand Prize and the Bonus Prize. The winning team(s) will be announced in a Final Award Ceremony.

3.7 POST-PRIZE IMPACT

The awarding of this XPRIZE marks the recognition of an audacious breakthrough with the potential to put humanity on a course to realize the vision where humanity and fire safely and sustainably co-exist. To realize this potential, XPRIZE will work with partners to address some of the most pressing innovation barriers—from regulatory hurdles, through access to investment, to deployment opportunities. Scaling impact activities will be offered to competing teams throughout the Competition, while Finalists teams will receive additional support following the awarding of the XPRIZE Wildfire.

By registering to compete in an XPRIZE Competition, teams will automatically be enrolled into the XPRIZE alumni network. This alumni network will allow XPRIZE to communicate with and support competitors well after a prize is completed. The objectives of the alumni network are to monitor post-prize impact; to support and scale team solutions; to create

opportunities for networking among alumni and with XPRIZE's partnership ecosystem; to provide continuing education for competitors; to invite and engage alumni in various conferences and events. At any point in time, where a competitor no longer wishes to be an alumnus of XPRIZE, they may opt out of the alumni network.

4. COMPETITION ECOSYSTEM

4.1 COMPETING TEAMS

- A. **GOOD STANDING.** Teams must register their intent to compete on the XPRIZE Prize Operations Portal (POP), sign the Competitor Agreement, and pay the registration fee ahead of the deadline in order to be eligible for an award. Each team must specify a legal entity (ie individual or corporation). At milestones where prize money is awarded, XPRIZE will pay the award to the specified legal entity.
- B. **FUNDRAISING.** All costs of competing in XPRIZE Wildfire are the responsibility of the competing team.
- C. **SAFE AND ETHICAL BEHAVIOR.** Teams are responsible for maintaining the health and safety of their teams and the environment over the course of their participation in the prize. Teams must comply with all laws and regulations which apply to their participation in the prize. XPRIZE reserves the right to expel teams who do not uphold reasonable standards of safety and ethics.

4.2 ADVISORY BOARD

- A. **SELECTION OF ADVISORS.** XPRIZE will appoint a panel of topical experts and big-picture thought leaders to serve as the “**Advisory Board**” (AB) for the Competition. The AB will remain in place throughout the Competition to advise XPRIZE regarding the scientific and other elements of the Competition.
- B. **INDEPENDENT ADVISORY BOARD.** The AB will be independent of XPRIZE and all teams and team members. No Advisor, nor any member of the Advisor's immediate family, shall participate, nor have any financial or other material interest, in XPRIZE, the Sponsor(s), and/or any team or team member. All members of the AB shall promptly disclose to XPRIZE any such current, former, or expected future conflict of interest with XPRIZE, the Sponsor, or any team or team member.

- C. **ROLE OF ADVISORY BOARD.** The duties and responsibilities of the AB may include, but not be limited to: (i) assisting with the establishment of qualifications for prospective Judges; (ii) recommending members of the Judging Panel; (iii) assisting with development of testing protocols and judging criteria; (iv) and providing input toward the development of these Competition Guidelines.

4.3 JUDGING PANEL

- A. **SELECTION OF JUDGES.** The XPRIZE will propose Judging Panel candidates to the AB for its review and consideration. The AB will recommend the candidates it believes are best suited to serve on the Judging Panel. XPRIZE will secure the judging panel based on the AB recommendations.
- B. **INDEPENDENT JUDGING PANEL.** The Judging Panel will be independent of XPRIZE, the Title Sponsor, any other Sponsors, and all teams and team members. No Judge, nor any member of Judge's immediate family, shall participate, nor have any financial or other material interest, in XPRIZE, the Sponsor(s), and/or any team or team member. All members of the Judging Panel shall promptly disclose to XPRIZE any such current, former, or expected future conflict of interest with XPRIZE, the Sponsor, and/or any team or team member.
- C. **ROLE OF JUDGING PANEL.** The duties and responsibilities of the Judging Panel will include, but not be limited to: (i) evaluating teams' compliance with the Competitor Agreement as they relate to prize operations, these Competition Guidelines, and the Rules & Regulations for the purposes of the Competition; and (ii) the awarding of points and selection of teams that will proceed to each subsequent round of the Competition.
- D. **GROUNDINGS FOR JUDGING PANEL DECISIONS.** Official decisions made by the Judging Panel will be approved by a majority of the Judges that vote on each such decision after careful consideration of the testing protocols, procedures, guidelines, rules, regulations, criteria, results, and scores set forth in the Competitor Agreement, these Competition Guidelines, Rules and Regulations for Track A and Track B, and all other applicable Exhibits to the Competitor Agreement. If any vote of the Judges results in a tie, then the Judging Panel shall determine, in its sole and absolute discretion, the mechanism to settle the tie. Similarly, if one or more teams are tied at any stage during the Competition, the Judging Panel shall have the sole and absolute discretion to settle the tie.
- E. **DECISIONS OF JUDGING PANEL ARE FINAL.** The Judging Panel shall have sole and absolute discretion: (i) to allocate duties among the Judges; (ii) to determine the degree of accuracy and error rate that is acceptable to the Judging Panel for all Competition calculations, measurements, and results, where not specified in the Rules & Regulations; (iii) to determine the methodology used by the Judging Panel to render its decisions; (iv) to declare the winners of the Competition; and (v) to award the prize purses and other awards. Decisions of the Judging Panel shall be binding on XPRIZE, teams, and each team member. XPRIZE and teams agree not to dispute any decision or ruling of the Judging Panel, including decisions regarding the degree of accuracy or error rate of any

Competition calculations, measurements, and results. Teams shall have no right to observe other teams' testing or evaluation, or to be informed of other teams' calculations, measurements, and results, unless such information is made publicly available by XPRIZE.

4.4 COMPETITION PARTNERS

Achieving global impact requires global action. XPRIZE strives to cultivate networks of partners to support the Competition from design conception through the awarding of the prize and beyond. Partners may include individuals, government entities, businesses, non-profit organizations, coalitions, or other groups. Partners may provide industry and technology knowledge as well as in-kind or discounted services and products to directly support XPRIZE and teams throughout the Competition. As applicable, XPRIZE will connect teams with partner-provided resources. Collaboration with Competition partners is encouraged, but optional.

5. INTELLECTUAL PROPERTY

As of the date of submission, each Team must own, or hold appropriate license rights to, all technologies, methods, resources, and Intellectual Property included in its submission.

Teams will retain ownership of their Intellectual Property on any technology or data integration techniques and processes they bring to the Competition, and which they develop as part of their Competition entry. All details relating to team technology, innovations, or methods submitted to XPRIZE at the submission deadlines will remain strictly confidential unless clearly and specifically noted. Please refer to the Competitor Agreement for more details.

XPRIZE will adhere to national or international regulations regarding ownership of the data and insights produced as part of the Competition. If none such regulations pertain to the data collected during the course of the Competition, XPRIZE will retain ownership of such data and insights. These data and insights will only be released following the conclusion of the Competition to interested stakeholders who have demonstrated a commitment to managing wildland fires, and who will be incentivized to sustain their commitment. Please see the Competitor Agreement for additional details on Intellectual Property.

APPENDIX

GLOSSARY

Accurate (*Accuracy, Accurately*)

The correctness (closeness to true value) and quality of the wildfire observation and intelligence (includes fire behavior characterization and false positives).

Advisory Board

A select group of prominent advisors who contribute their wisdom, knowledge and guidance to various aspects of the prize

Alumni Network

A community of former and current XPRIZE competitors and teams through which XPRIZE and such teams can continue to communicate and collaborate with one another. The objectives of the alumni network are to monitor post-prize impact; to support and scale team solutions; to create opportunities for networking among alumni and with XPRIZE's partnership ecosystem; to provide continuing education for competitors; to invite and engage alumni in various conferences and events. Registered teams are automatically enrolled but may opt out at any time.

Autonomous Wildfire Response

One of two Competition tracks in the XPRIZE Wildfire, focused on the rapid and intelligent detection, response, and full suppression of an incipient stage destructive wildfire.

Base Station

A camp that teams will use to manage their operations and launch their Solution into the Competition Area during testing

Competition

Refers to XPRIZE Wildfire, including both or either tracks.

Competition Area

The location selected and/or approved by XPRIZE to conduct testing.

Competitor Agreement

A legal and binding document that details the responsibilities of competitors for the prize.

Core Problems

Challenges that currently inhibit fire management practices that innovations in technology could help solve

Decoy fires

Safely contained fires and other false positives (e.g., solar panels, water vapor).

Discretionary Late Registration

A limited opportunity to enable select teams to join the Competition after the standard registration deadline. Interested teams should contact XPRIZE for more details about entering at wildfire@xprize.org.

Dispatch Center

Any local or national answering point for public emergency calls.

Environmentally Challenging

In this Competition the definition is inclusive of man-made obstacles and/or structures, vegetation, terrain, and weather conditions. Specifically, **fuel** type (mixed fuel), terrain (steep, $\geq 45\%$ slopes) and (near) **Red Flag Weather**.

Extreme Wildfire Event (EWE)

The concept of EWEs has emerged in recent years to describe the growing phenomenon of devastating wildfires, which are often described as “fast-moving,” “high-intensity,” or by their size (of area burned). EWE comes to describe an extreme fire behavior, demonstrating characteristics that move between “virtually impossible” to “impossible” to control and suppress.

False Positives

items and environmental features that can be mistaken for fires in detection. False positives are largely associated with hot spots - reflective and hot surfaces, such as water bodies and solar panels, and include other environmental features such as water vapor, which can be mistaken for smoke.

Finals Testing

The last set of testing events for the prize that will determine the Grand Prize winning teams.

Finalist Verification

This is a mandatory update to ensure teams are prepared to proceed to Finals Testing. This will most likely consist of written and filmed components.

Fuel

Plant material that acts as fuel for wildfires, including grass, shrubs, trees, dead leaves, and fallen pine needles.

Full suppression

Extinguish the fire ('fire out') and any spot fires.

High-Risk Fire

A fire that began moving or reached 2 meters in diameter.

Incident Command Post

The field location at which the primary tactical level, on-scene incident command functions are performed.

Incipient Stage Wildfire

A fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus.

Judging Panel

The subject matter and technical experts who serve as an impartial and independent evaluation team for all aspects of this prize. Judges score the team submissions and make the final award determinations in both the Semifinals and the Finals Competitions.

Public Comment Period

Feedback about the Competition Guidelines may be submitted by any readers, including prospective competitors from April 21 - May 17, 2023. XPRIZE will review the comments and take any potential revisions to the guidelines into consideration.

Precise (*Precision, Precisely*)

(Location) proximity to the target fire.

Prize Operations Platform (POP)

The standard internal XPRIZE portal for teams to complete required activities in this Competition.

Prize Purse

This refers to money offered, won, or received as a prize. It also refers to the overall amount of funds allocated to all prizes in this Competition.

Qualifying Technical Submission

This submission consists of a series of questions to be answered that outline the expertise, capabilities and plans for the functional technology that each team will create. It will also require an Executive Summary of up to two pages of text, and any supporting images, diagrams, or charts.

Red Flag Weather

Weather conditions that fuel extreme wildfire events. These conditions include low fuel moisture and relative humidity, sustained high winds around 30 km/h or gusts greater than 56 km/h, unstable atmosphere, and high temperatures.

Round

A stage of the competition which includes a judged activity (submission or field testing) and results in a downselection of competing teams.

Rules & Regulations

A set of documents detailing the testing protocols, specific rules, dates/times, and other details that will govern the Competition and will be binding on teams for Track A and Track B.

Semifinals Testing

The set of testing events for the prize that will help determine which teams progress to Finals Testing.

Space

For the purposes of XPRIZE Wildfire, the boundary of Space is defined as an altitude of 100 km (Kármán Line).

Space-Based Wildfire Detection & Intelligence

One of two Competition tracks in the XPRIZE Wildfire, focused on advancements in accuracy and precision of Earth Observing capabilities for global wildfire detection.

Team Definitions

- **Interested Team:** A team or individual that is interested in participating in the Competition and has created a profile in the XPRIZE POP system.
- **Registration in Progress:** A team that has completed registration but has not yet paid the fee and signed the Competitor Agreement.
- **Registered Team:** A team that has paid the required registration fee, signed the Competitor Agreement, and is eligible to submit a Qualifying Submission for the Judging Panel's review.
- **Qualified Team:** A team that has been selected by the Judging Panel from the pool of Registered Teams based on the strength of their Qualifying Submission.
- **Semifinalist Team:** A team that has successfully completed the necessary technical submission and is approved by the Judging Panel to advance in the Competition.
- **Finalist Team:** A team that has successfully completed Semifinals Testing and is approved by the Judging Panel to attend Finals Testing.

System Technical Verification

The process by which Qualified Teams demonstrate they are prepared to proceed to Extreme Conditions Testing. This submission will consist of written and filmed components which the Judging Panel will review to verify each team's ability to participate in testing.

Wildland-Urban Interface (WUI)

The Wildland-Urban Interface (WUI) is where a community meets or mixes with the wildland; it is where the risk to life and assets is most heightened.