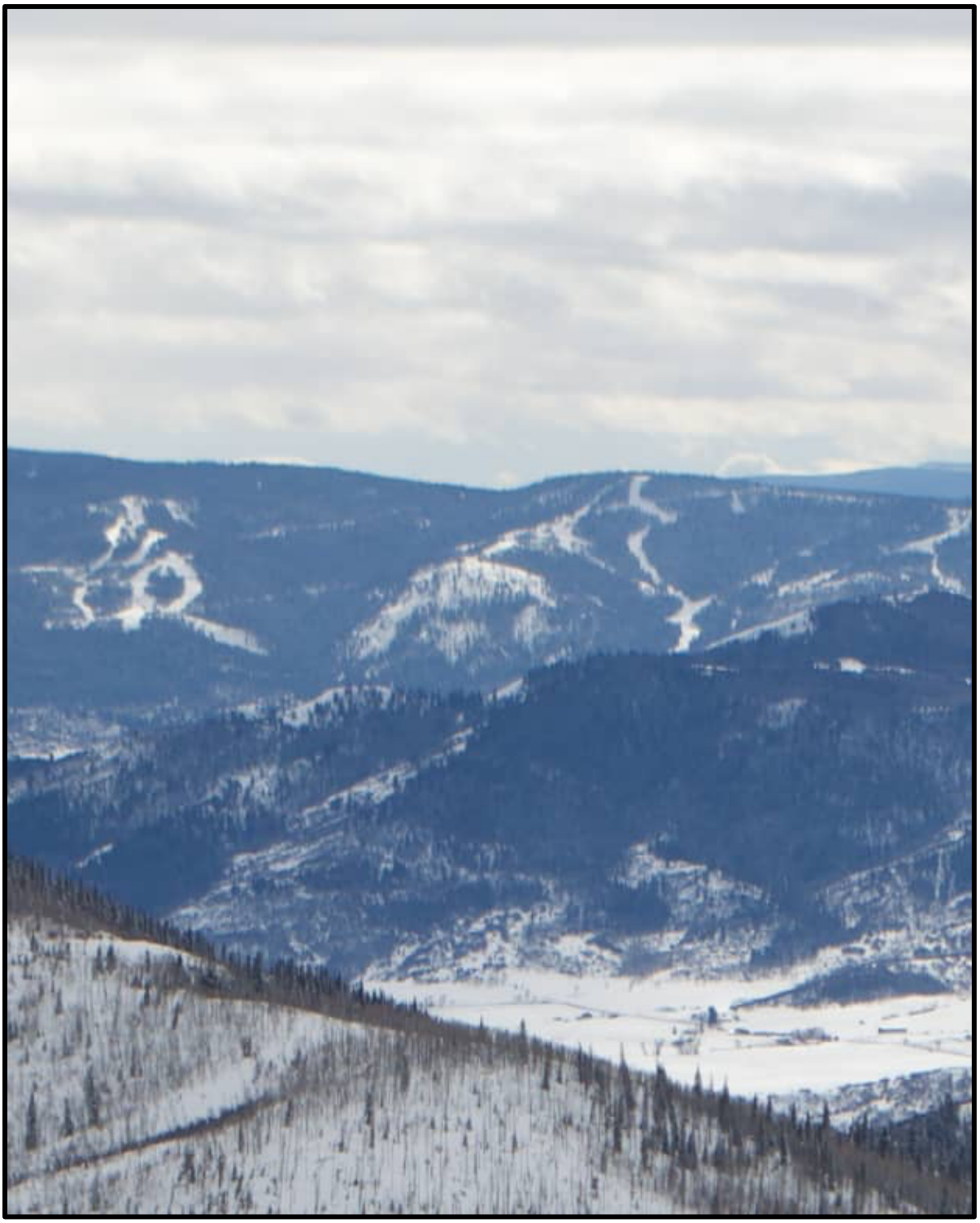
STAGECOACH MOUNTAIN RANCH WILDFIRE PROTECTION PLAN



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Introduction

The purpose of this Wildfire Protection Plan is to establish a proactive framework for reducing the risk of wildfires and mitigating their potential impacts on communities, infrastructure, and natural environments. This document provides a variety of guidelines, procedures and strategies that are recommended to minimize wildfire risk, improve structural resilience to a potential wildfire event and protect human life and safety. This plan seeks to enhance the safety and resilience of at-risk areas through a combination of prevention, preparedness, and response strategies. By identifying vulnerable regions, implementing fuel management practices, and fostering community awareness and cooperation, the plan aims to minimize the occurrence of wildfires and limit their destructive effects. Ultimately, this Wildfire Protection Plan strives to protect lives, property, and ecosystems, while promoting sustainable land management practices and long-term resilience against wildfire threats.

Existing Conditions

Planning Area and Community Description:

As Stagecoach Mountain Ranch (SMR) is developed, the fuel scape within the parcel(s) and common space boundaries will change as native timber, grasslands, and shrublands are converted to hardscape features, structural elements, and landscaped and lawn areas that are regularly maintained and irrigated. While conversion of these fuels will generally lower wildfire risk within the developed footprint, the risk to property and life safety will increase as the community is built out and residents move in. In addition, SMR is positioned in a rural landscape surrounded by areas identified as having moderate to high wildfire hazards. SMR is located West and South of the Stagecoach Reservoir. The total project is approximately 6,425 acres and is planned to be a mixed-use residential development with intermixed commercial and recreational property use. Approximately 697 residential units (including 291 single-family dwellings, 191 cabins, 112 duplexes, 103 condos, and 202k feet of commercial structures.) The Routt County CWPP identifies 71% of the County as “high risk” for wildfire, which includes the SMR planning area. SMR is situated within the Oak Creek Fire Protection District.

Wildfire Protection Plan Objectives and Strategies

The Objectives and Strategies of the Stagecoach Mountain Ranch Wildfire Protection Plan delineate a comprehensive approach to address all phases of wildfire events in South Routt County. Encompassing mitigation, education, and prevention, this section outlines the overarching goals of the plan and the strategic roadmap for their implementation. The objectives and strategies identified are linked and codified to the purpose of the Routt County Community Wildfire Protection Plan (CWPP). The CWPP identifies (1) Human Life and well-being, (2) critical infrastructure, (3) economic drivers, and (4) property as the ranked community values and assets as they relate to wildfire destruction. This plan through Objectives and Strategies, aims to:

- Enhance wildfire mitigation efforts to minimize the risk of ignition and spread within the Stagecoach Mountain Ranch and surrounding communities.
- Develop robust response protocols to swiftly and effectively combat wildfires, prioritizing the safety of residents and first responders.
- Establish proactive education for living in a wildfire environment to support community resilience.
- Adhere to local, county, state, and national guidelines/regulations addressing living within the Wildland Urban Interface.

Objectives:

1) **Risk Assessment and Identification**:
    i) Identify areas at high risk for wildfires through comprehensive risk assessment and mapping.
    ii) Evaluate the factors contributing to wildfire risks, such as vegetation, climate, and human activity.
2) **Prevention and Mitigation**:
    i) Implement measures to reduce the likelihood of wildfires starting and spreading.
    ii) Promote fire-resistant landscaping and building practices.
3) **Community Preparedness**:
    i) Enhance public awareness and education on wildfire risks and safety measures.
    ii) Develop and disseminate emergency plans and evacuation routes.
4) **Response and Recovery**:
    i) Establish efficient response protocols and coordination among emergency services.
    ii) Develop strategies for quick recovery and rehabilitation post-wildfire.
5) **Sustainable Land Management**:
    i) Encourage practices that reduce wildfire risks and promote healthy ecosystems.
    ii) Integrate wildfire considerations into land use planning and management.

Strategies:

1) **Risk Assessment and Mapping**:
    i) Utilize geographic information systems (GIS) and remote sensing technologies to identify high-risk areas.
    ii) Conduct regular assessments to update and refine risk maps.
2) **Vegetation Management**:
    i) Implement controlled burns and mechanical thinning to reduce fuel loads in forests and grasslands.
    ii) Create defensible spaces around homes and communities by clearing flammable vegetation.
3) **Building Codes and Regulations**:
    i) Enforce fire-resistant building codes and materials for new constructions and renovations.
    ii) Promote retrofitting existing structures with fire-resistant materials.
4) **Public Education and Outreach**:

    i) Launch awareness campaigns to educate residents about fire safety and preparedness.
    ii) Conduct community workshops and drills to ensure readiness for wildfire emergencies.
5) **Emergency Response Planning**:
    i) Develop and regularly update emergency response plans in collaboration with local authorities.
    ii) Train and equip firefighting personnel and ensure coordination among various agencies.
6) **Monitoring and Early Warning Systems**:
    i) Install and maintain fire detection systems, such as camera detection and satellite monitoring.
    ii) Develop early warning systems to alert communities of potential wildfire threats.
7) **Restoration and Rehabilitation**:
    i) Implement post-fire recovery plans to restore damaged ecosystems and infrastructure.
    ii) Provide support and resources for affected communities to rebuild and recover.
8) **Policy and Legislation**:
    i) Advocate for policies that support wildfire prevention and mitigation efforts.
    ii) Secure funding and resources for implementing wildfire protection measures.

By achieving these objectives through targeted strategies, the Wildfire Protection Plan aims to minimize the impact of wildfires and foster resilient communities and landscapes.

Landscape analysis

A Landscape Fuels Analysis in the Interagency Fuel Treatment Decision Support System (IFTDSS) is a specialized evaluation method used to assess and manage wildfire fuels across a given landscape. IFTDSS is a collaborative, web-based platform that integrate various tools and data to support fire and fuel management planning.

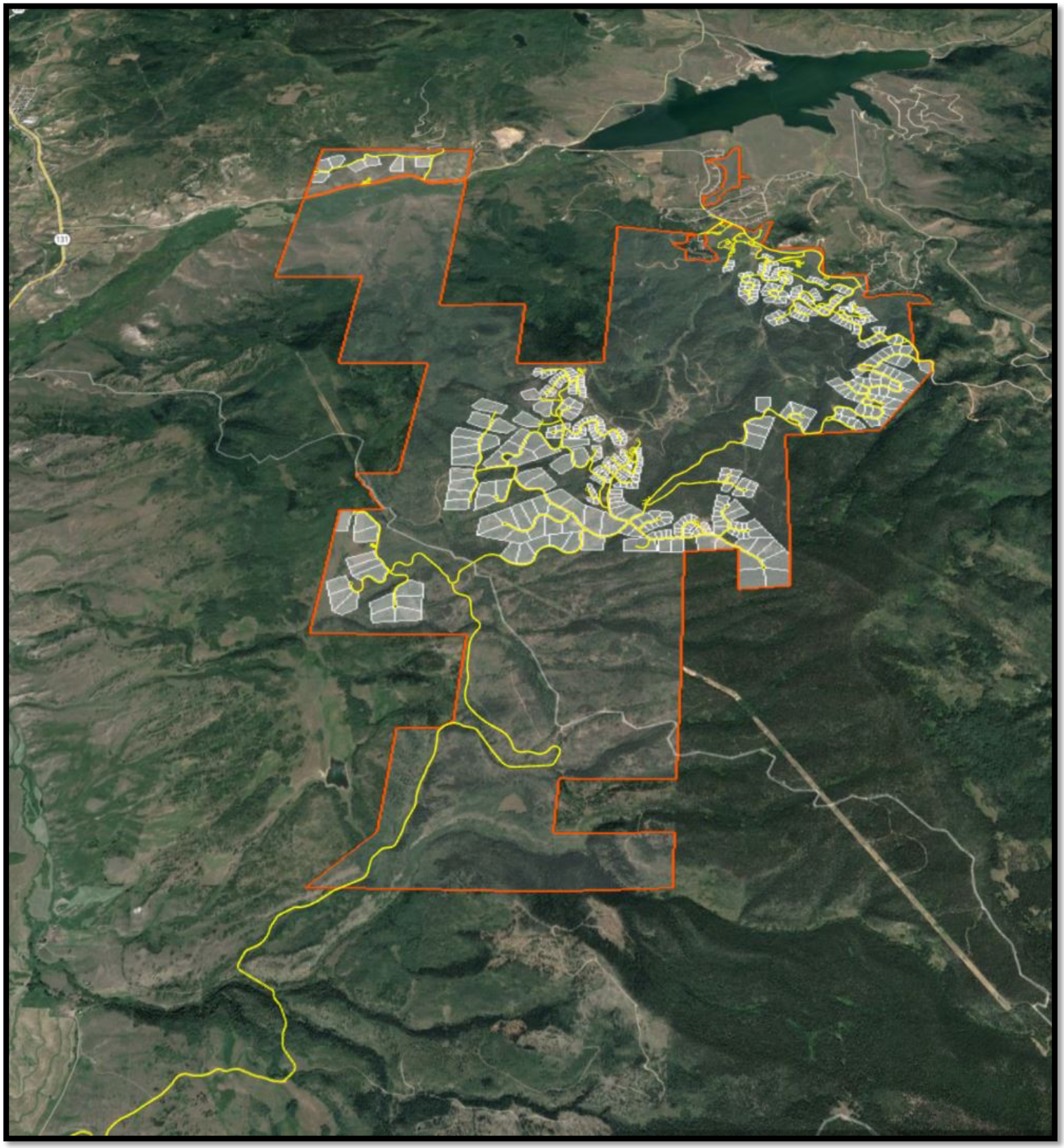
The primary objectives of a Landscape Fuels Analysis:

1. **Assessing Fuel Characteristics**: Identifying and mapping the types and distribution of fuels, such as grasses, shrubs, and trees. This includes understanding the composition, density, and arrangement of these fuels, which are critical factors in wildfire behavior.
2. **Evaluating Fire Behavior Potential**: Using fire behavior models to predict how fuels will influence fire spread, intensity, and severity under various weather conditions. This helps in understanding potential fire behavior across the landscape.
3. **Identifying High-Risk Areas**: Highlighting regions that are particularly susceptible to severe wildfire impacts due to the presence of heavy fuel loads or specific fuel types. This aids in prioritizing areas for fuel treatments and risk mitigation.
4. **Supporting Fuel Treatment Planning**: Providing data and insights necessary for planning and implementing fuel treatments, such as prescribed burns, mechanical

thinning, and other fuel reduction strategies. This includes evaluating the effectiveness of different treatment options in reducing fire risk**.**

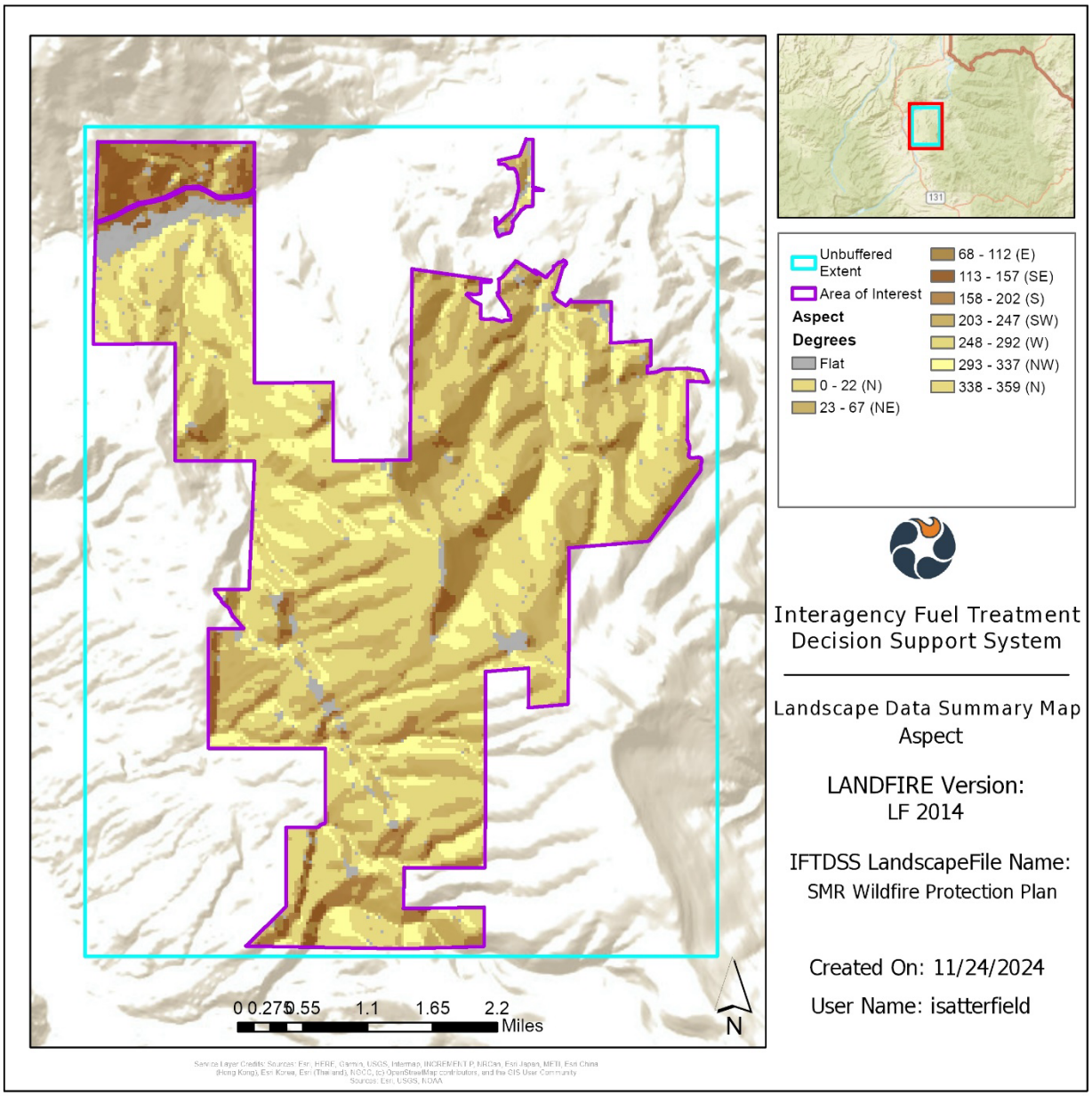
5. **Monitoring and Evaluating Treatment Effects**: Assessing the outcomes of fuel treatments over time to determine their effectiveness in altering fire behavior and reducing wildfire risk. This involves ongoing data collection and analysis to adapt and refine management strategies.
6. **Facilitating Collaboration and Decision-Making**: Enhancing communication and coordination among various stakeholders, including federal, state, and local agencies, through a shared platform and common data sets. This supports informed decision-making and integrated fire management efforts.

PROJECT AREA:



FUEL CHARACTERISTICS

ASPECT:



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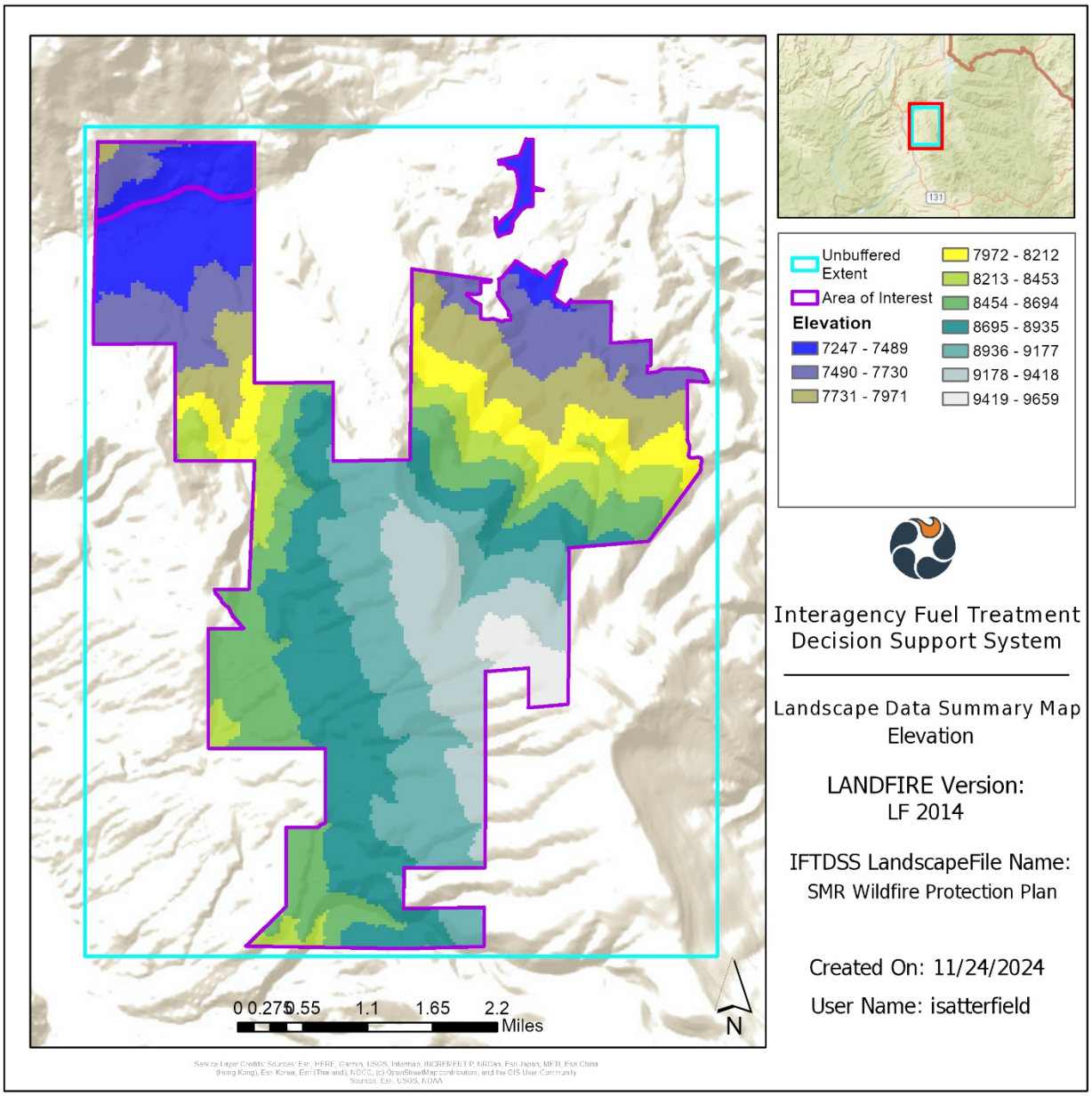
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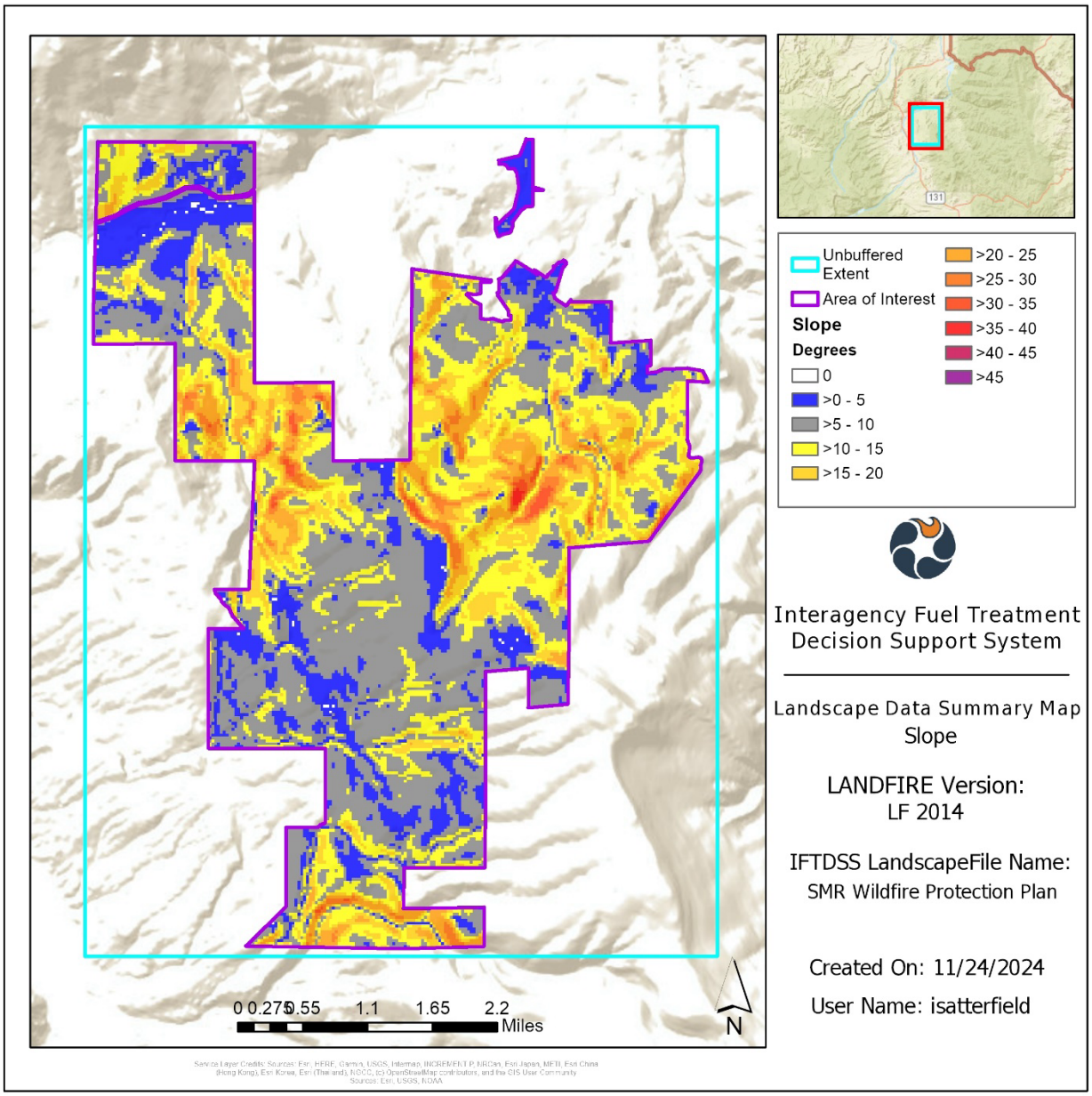
7490 - 7730
7731 - 7971
7972 - 8212
8213 - 8453
8454 - 8694
8695 - 8935
8936 - 9177
9178 - 9418
9419 - 9659
0 0.275 0.55 1.1 1.65 2.2
Miles
N
Interagency Fuel Treatment Decision Support System
Landscape Data Summary Map
Elevation
LANDFIRE Version:
LF 2014
IFTDSS LandscapeFile Name:
SMR Wildfire Protection Plan
Created On: 11/24/2024
User Name: isatterfield

SLOPE: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Area of Interest
Slope
Degrees
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>0 - 5
>5 - 10
>10 - 15
>15 - 20
>20 - 25
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>30 - 35
>35 - 40
>40 - 45
>45
Interagency Fuel Treatment Decision Support System
Landscape Data Summary Map
Slope
LANDFIRE Version:
LF 2014
IFTDSS LandscapeFile Name:
SMR Wildfire Protection Plan
Created On: 11/24/2024
User Name: isatterfield
0 0.275 0.55 1.1 1.65 2.2
Miles
N

Slope (degrees) Data Summary for Area of Interest "mpv3_propertyboundary" within "SMR Wildfire Protection Plan" Landscape

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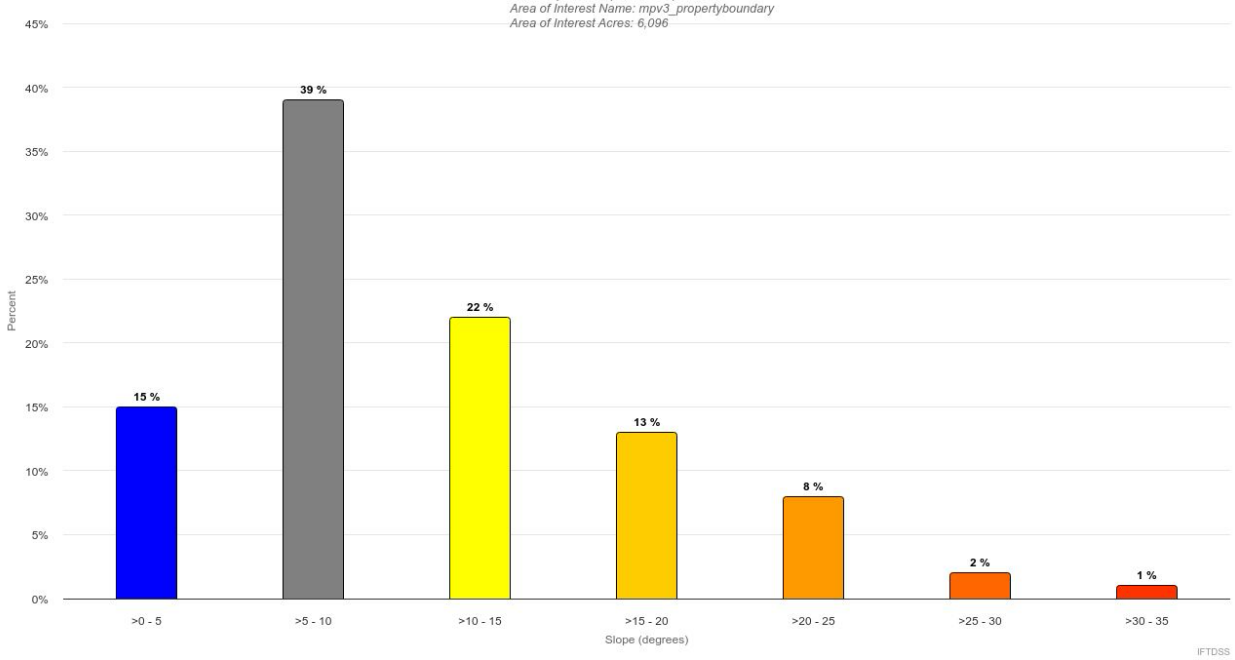
Landfire Version: LF 2014
Landscape Acres (unbuffered): 14,042
Area of Interest Name: mpv3_propertyboundary
Area of Interest Acres: 6,096



Slope (degrees) Data Summary for Area of Interest "mpv3_propertyboundary" within "SMR Wildfire Protection Plan - Auto97th" Model Output

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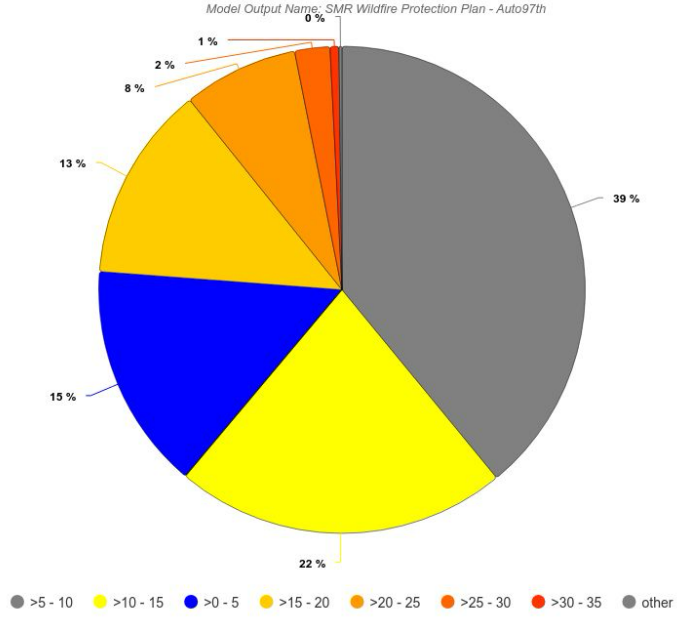
Landfire Version: LF 2014
Landscape Acres (unbuffered): 14,042
Area of Interest Name: mpv3_propertyboundary
Area of Interest Acres: 6,096
Model Output Name: SMR Wildfire Protection Plan - Auto97th



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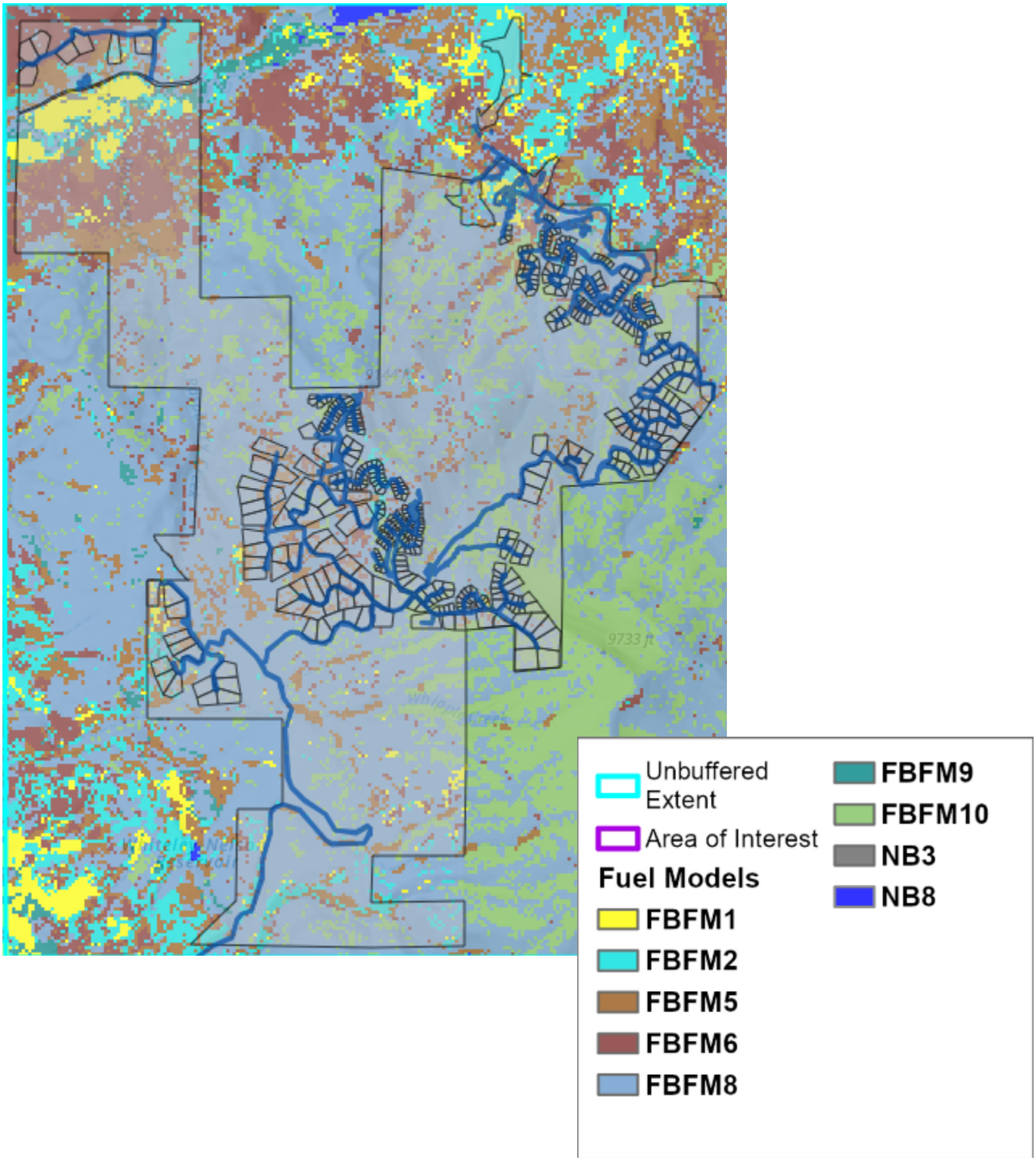
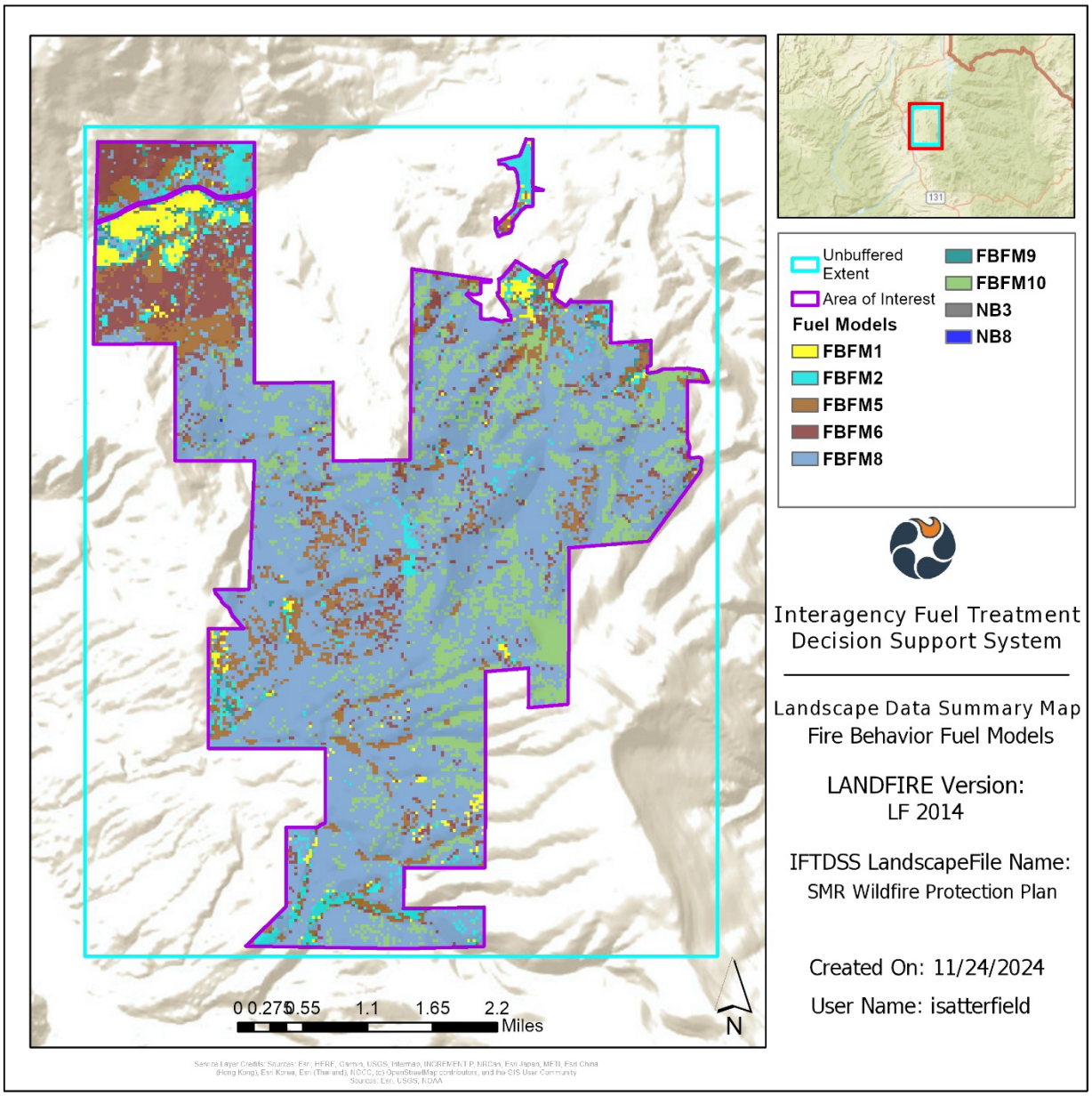


FUEL MODEL:


Unbuffered Extent
Area of Interest
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FBFM2
FBFM5
FBFM6
FBFM8
FBFM9
FBFM10
NB3
NB8
0 0.275 0.55 1.1 1.65 2.2
Miles
N
Interagency Fuel Treatment Decision Support System
Landscape Data Summary Map
Fire Behavior Fuel Models
LANDFIRE Version:
LF 2014
IFTDSS LandscapeFile Name:
SMR Wildfire Protection Plan
Created On: 11/24/2024
User Name: isatterfield

Fuel Model Data Summary for Area of Interest "mpv3_propertyboundary" within "SMR Wildfire Protection Plan - Auto97th" Model Output

Landscape Name: SMR Wildfire Protection Plan
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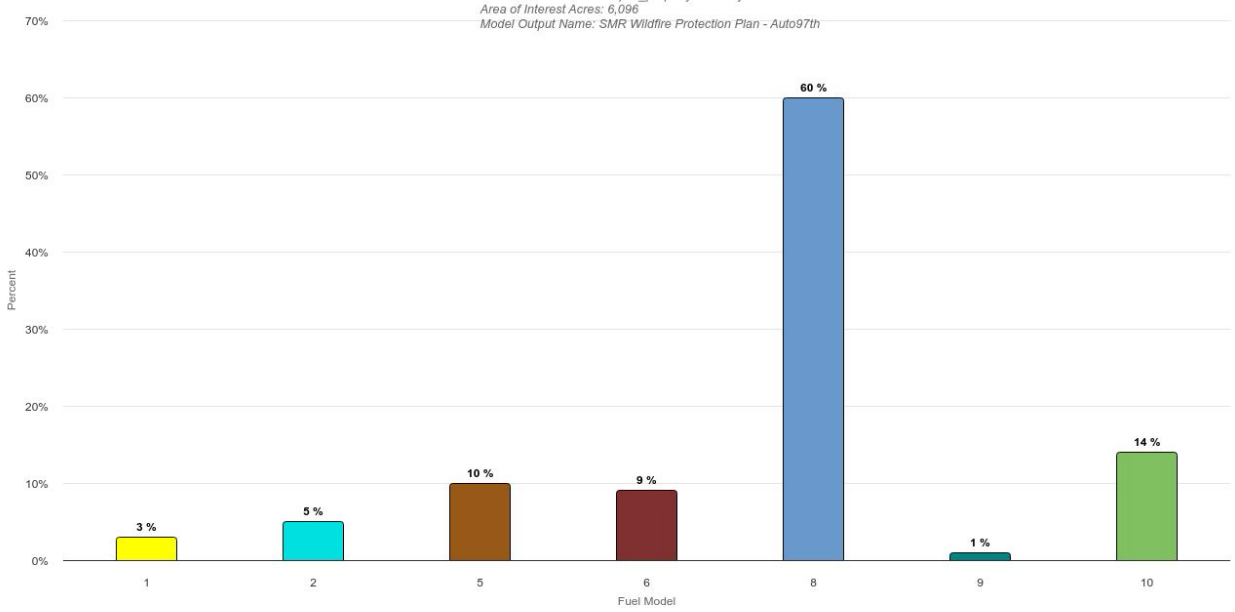
Area of Interest Name: mpv3_propertyboundary
Area of Interest Acres: 6,096
Model Output Name: SMR Wildfire Protection Plan - Auto97th



Distribution under 1% not shown

IFTDSS

Fuel Model Data Summary for Area of Interest "mpv3_propertyboundary" within "SMR Wildfire Protection Plan"

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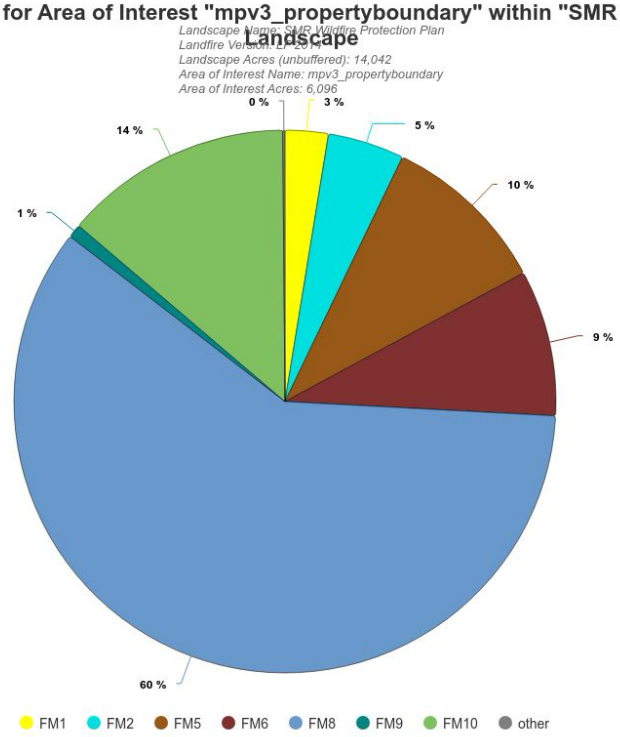
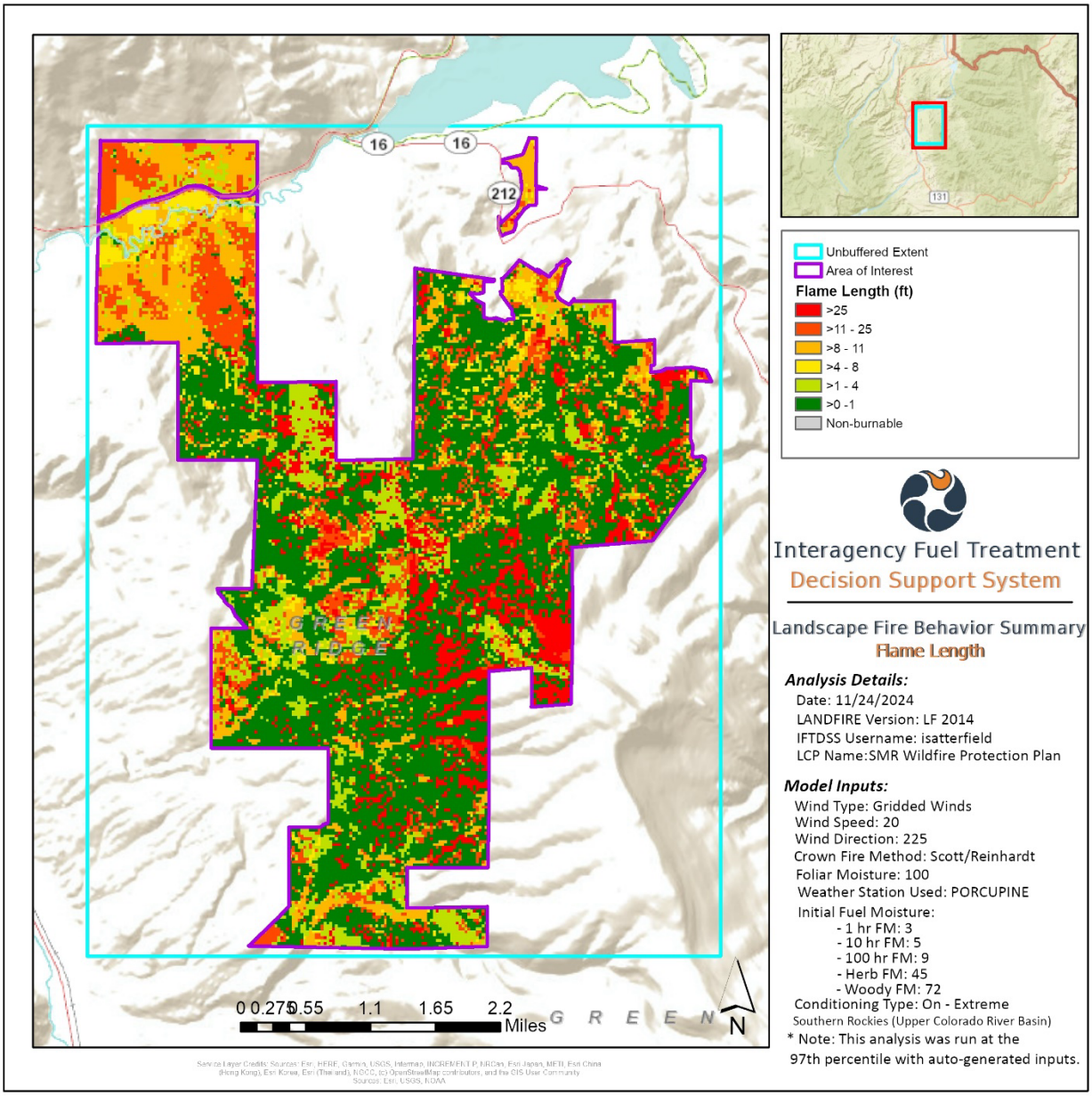
Landfire Version: LF 2014
Landscape Acres (unbuffered): 14,042
Area of Interest Name: mpv3_propertyboundary
Area of Interest Acres: 6,096



IFTDSS

Fire Characteristics

FLAME LENGTHS:



Flame Length (feet) Data Summary for Area of Interest "mpv3_propertyboundary" within "SMR Wildfire Protection Plan - Auto97th" Model Output

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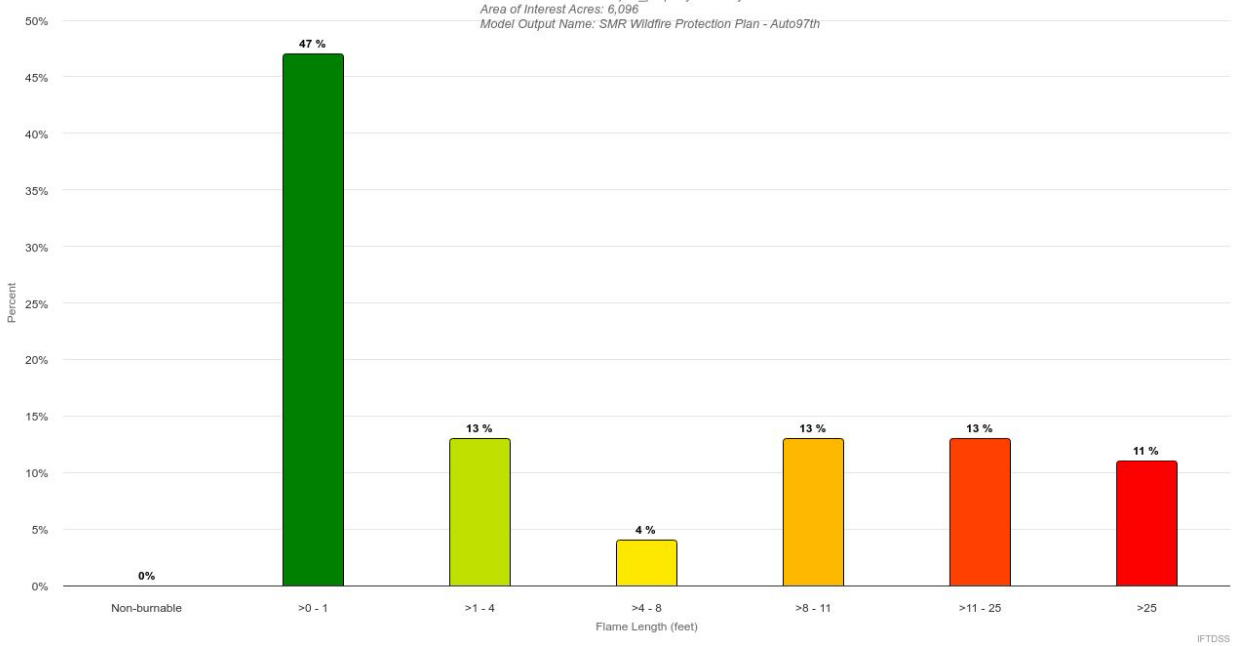
Area of Interest Acres: 6,096
Model Output Name: SMR Wildfire Protection Plan - Auto97th



Flame Length (feet) Data Summary for Area of Interest "mpv3_propertyboundary" within "SMR Wildfire Protection Plan - Auto97th" Model Output

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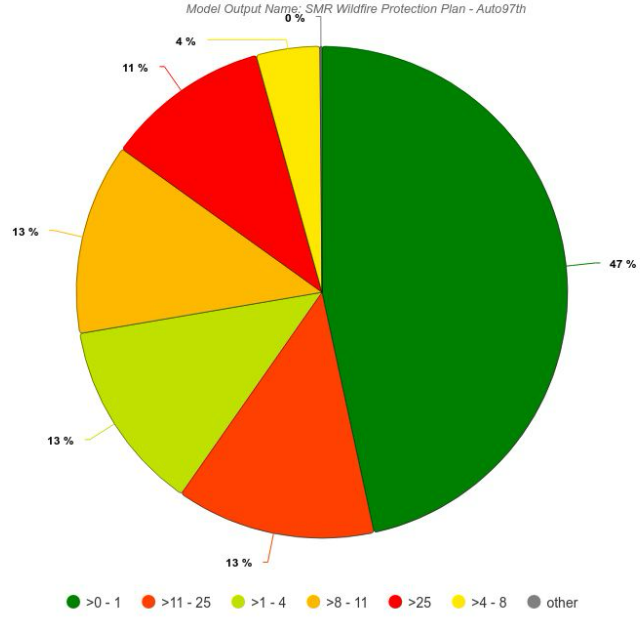
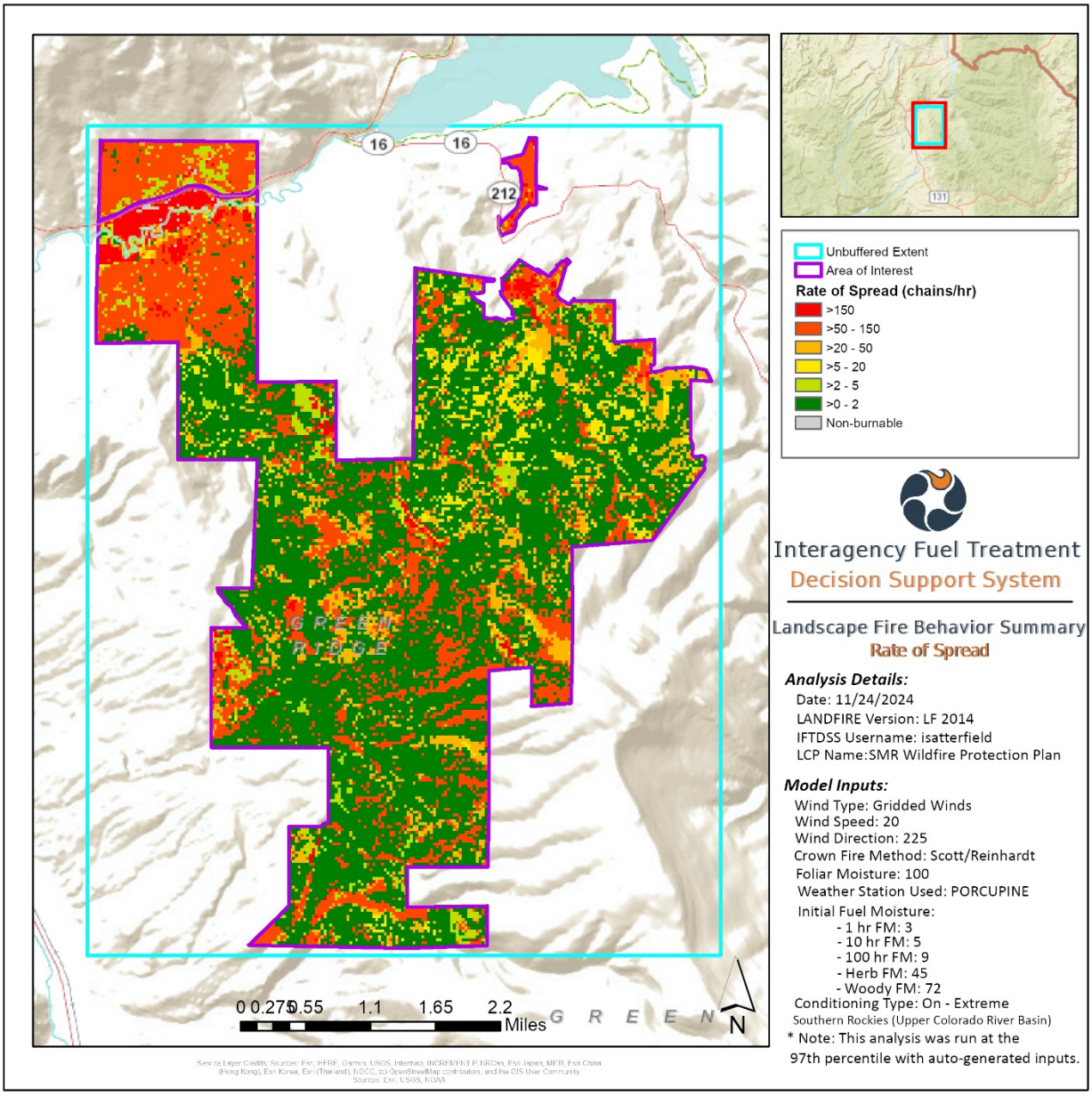
Area of Interest Name: mpv3_propertyboundary
Area of Interest Acres: 6,096
Model Output Name: SMR Wildfire Protection Plan - Auto97th



RATE OF SPREAD:



Rate of Spread (chains/hr) Data Summary for Area of Interest "mpv3_propertyboundary" within "SMR Wildfire Protection Plan - Auto97th" Model Output

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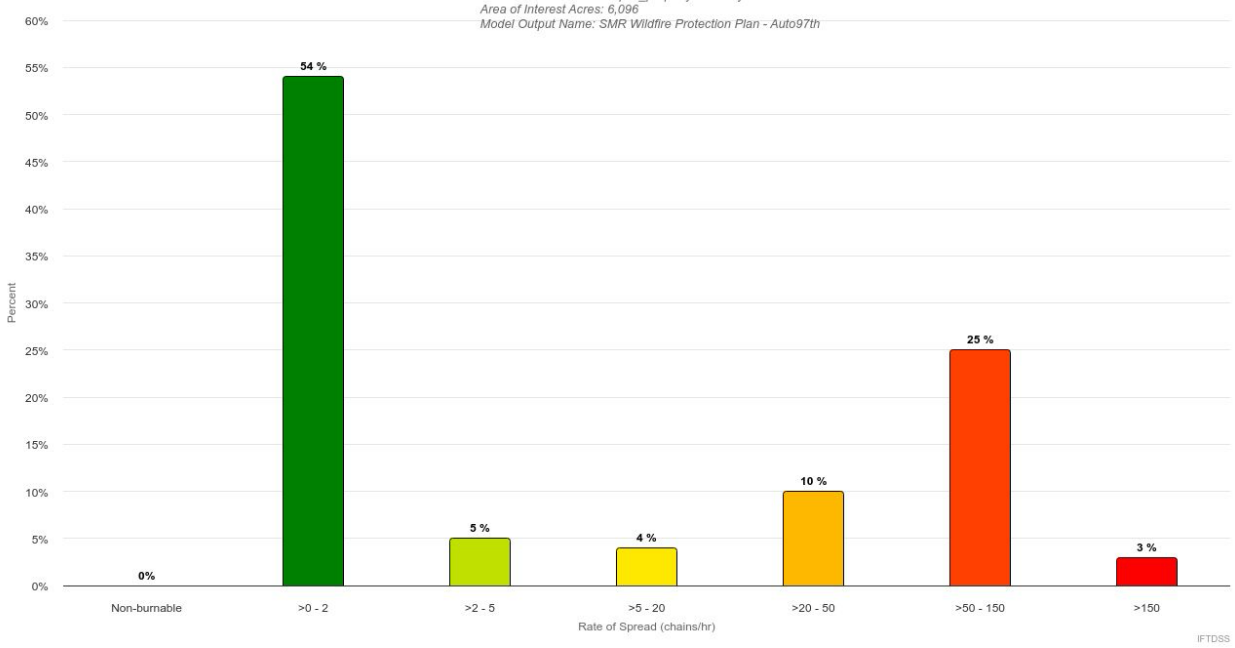
Area of Interest Acres: 6,096
Model Output Name: SMR Wildfire Protection Plan - Auto97th



Rate of Spread (chains/hr) Data Summary for Area of Interest "mpv3_propertyboundary" within "SMR Wildfire Protection Plan - Auto97th" Model Output

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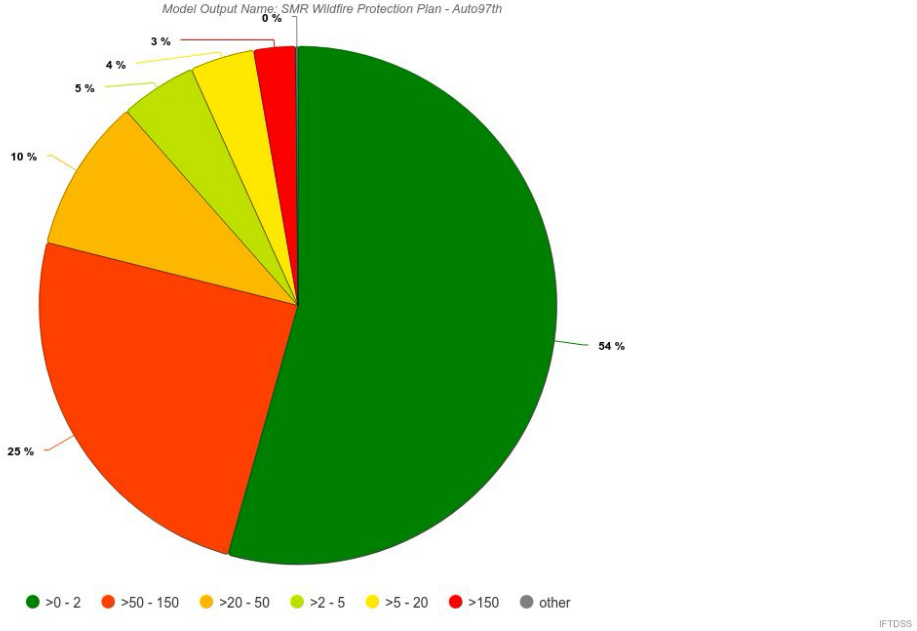
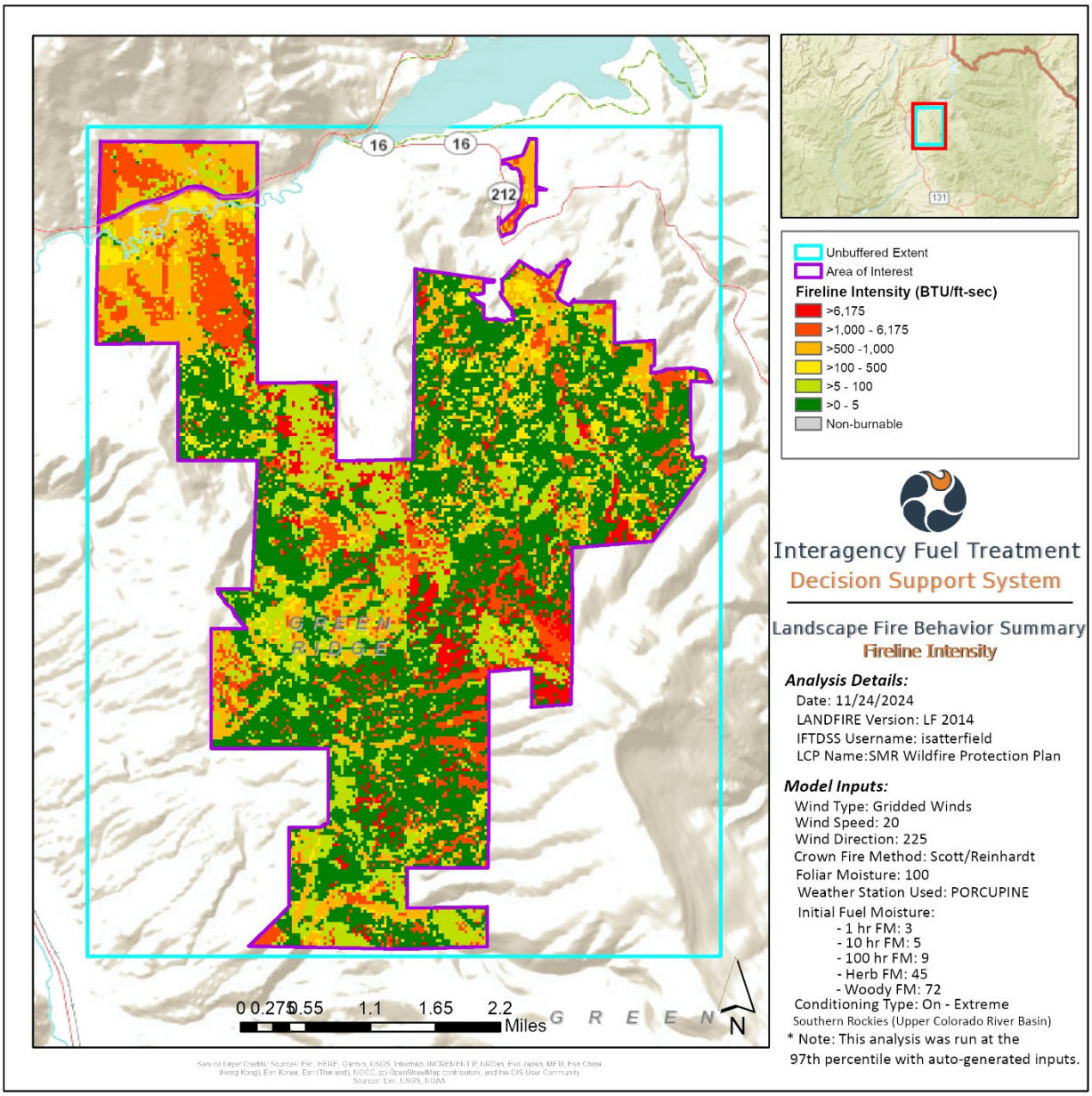
Area of Interest Name: mpv3_propertyboundary
Area of Interest Acres: 6,096
Model Output Name: SMR Wildfire Protection Plan - Auto97th



FIRELINE INTENSITY:



Fireline Intensity (BTU/ft-sec) Data Summary for Area of Interest "mpv3_propertyboundary" within "SMR Wildfire Protection Plan - Auto97th" Model Output

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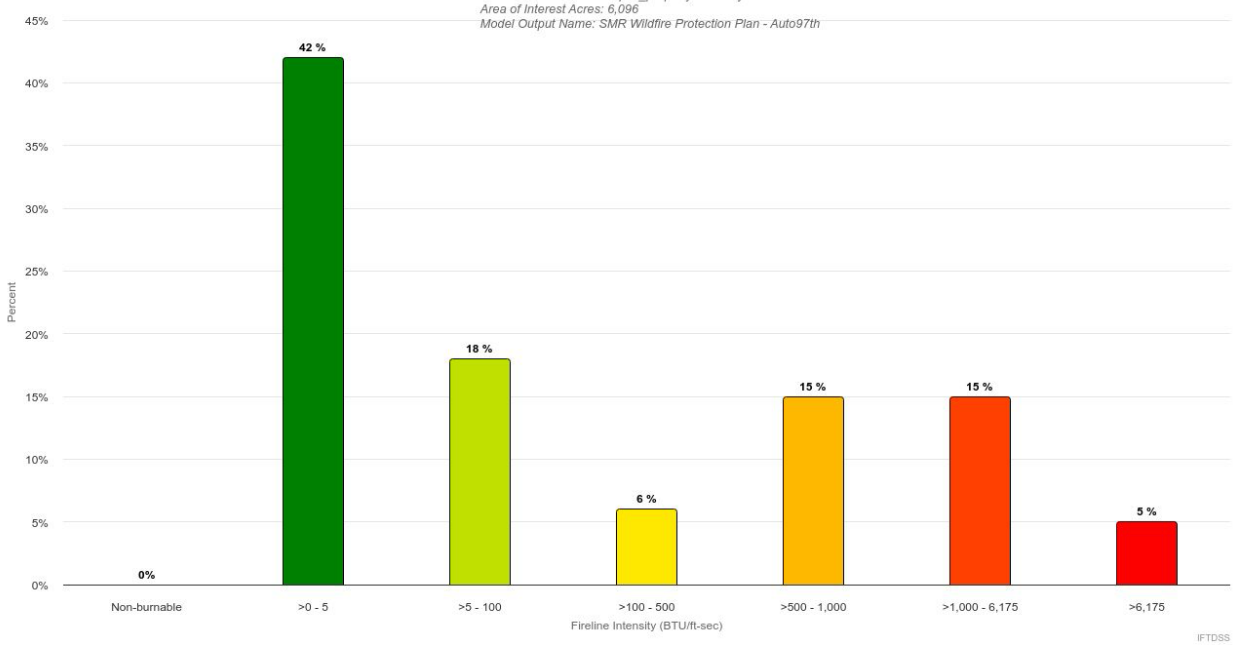
Area of Interest Name: mpv3_propertyboundary
Area of Interest Acres: 6,096
Model Output Name: SMR Wildfire Protection Plan - Auto97th



IFTDSS

Fireline Intensity (BTU/ft-sec) Data Summary for Area of Interest "mpv3_propertyboundary" within "SMR Wildfire Protection Plan - Auto97th" Model Output

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Landfire Version: LF 2014
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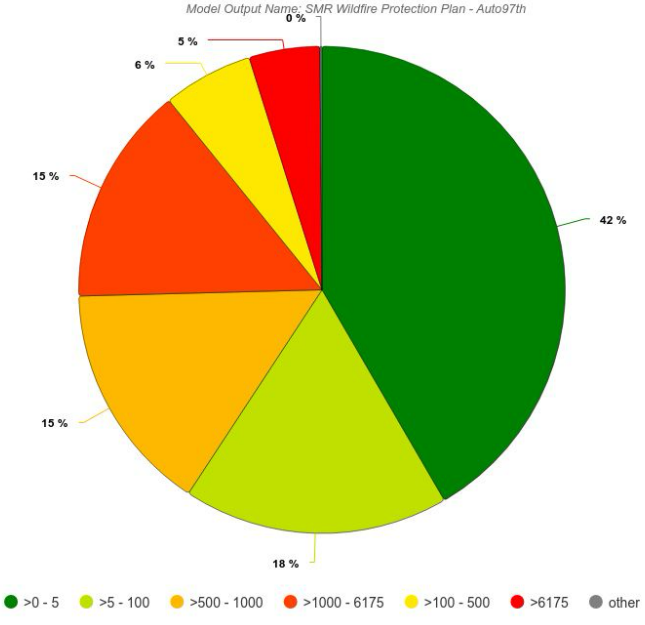
Area of Interest Name: mpv3_propertyboundary
Area of Interest Acres: 6,096
Model Output Name: SMR Wildfire Protection Plan - Auto97th



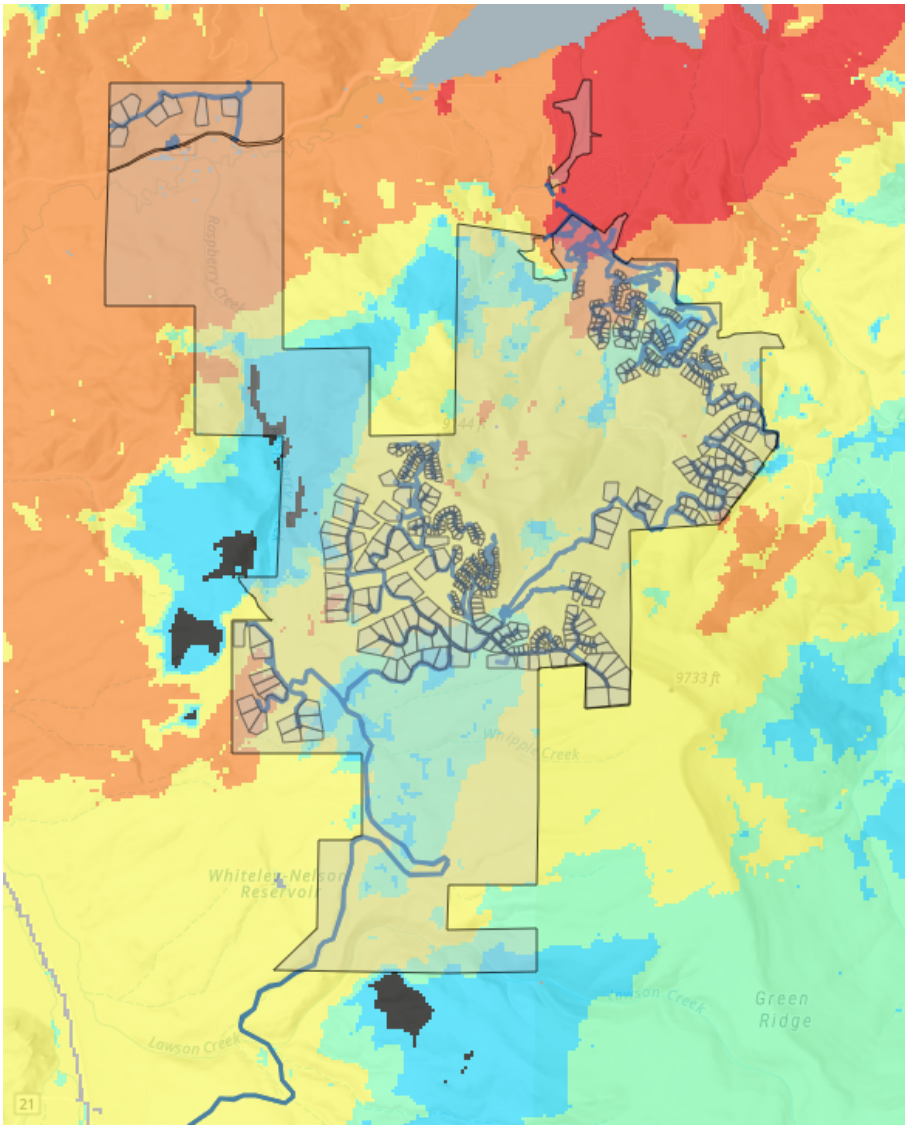
IFTDSS

Fire Behavior Potential:

Fire behavior potential refers to the characteristics and conditions that determine how a wildfire will behave in each area. It encompasses several interrelated factors, each of which plays a crucial role in influencing fire spread, intensity, and severity. The key components of fire behavior potential include:

1) Fuel Characteristics:
    a) Type of Fuels: The kind of vegetation or material available to burn, such as grasses, shrubs, trees, or dead leaves. Different fuel types burn at different rates and intensities.
    b) Fuel Moisture Content: The amount of moisture in the fuels affects how easily they can ignite and sustain combustion. Lower moisture content generally leads to higher fire behavior potential.
    c) Fuel Load: The quantity of available fuel in each area, typically measured in tons per acre. Higher fuel loads can contribute to more intense fires.
    d) Fuel Continuity: The distribution and connectivity of fuels across the landscape. Continuous fuels can support rapid fire spread, while discontinuous fuels may limit fire growth.
2) Topography:
    a) Slope: The steepness of the terrain. Fires tend to spread more quickly uphill due to the preheating of fuels upslope.
    b) Aspect: The direction a slope faces, which can influence fuel moisture and temperature. South-facing slopes in the Northern Hemisphere typically receive more sunlight and may have drier fuels.
    c) Elevation: Higher elevations can experience different weather patterns, temperatures, and fuel types, all of which can affect fire behavior.
3) Weather Conditions:
    a) Wind: Wind speed and direction are critical factors in fire spread. Strong winds can carry embers ahead of the main fire, starting new spot fires and increasing the fire's rate of spread.
    b) Temperature: Higher temperatures can dry out fuels, making them more flammable.
    c) Humidity: Low relative humidity can dry out fuels and increase the likelihood of ignition and sustained burning.
    d) Precipitation: Recent rainfall can reduce fire behavior potential by increasing fuel moisture, while prolonged dry periods can have the opposite effect.
4) Ignition Sources:
    a) Natural Ignitions: Lightning is a common natural ignition source for wildfires.
    b) Human Activities: Campfires, machinery, arson, and other human activities can start fires.
5) Fire History:
    a) Previous Fires: Areas that have experienced recent fires may have reduced fuel loads, affecting current fire behavior potential.
    b) Fire Regime: The historical pattern of fire frequency, intensity, and size in an area, which influences the current landscape's fuel structure and composition.

BURN PROBOBILITY:

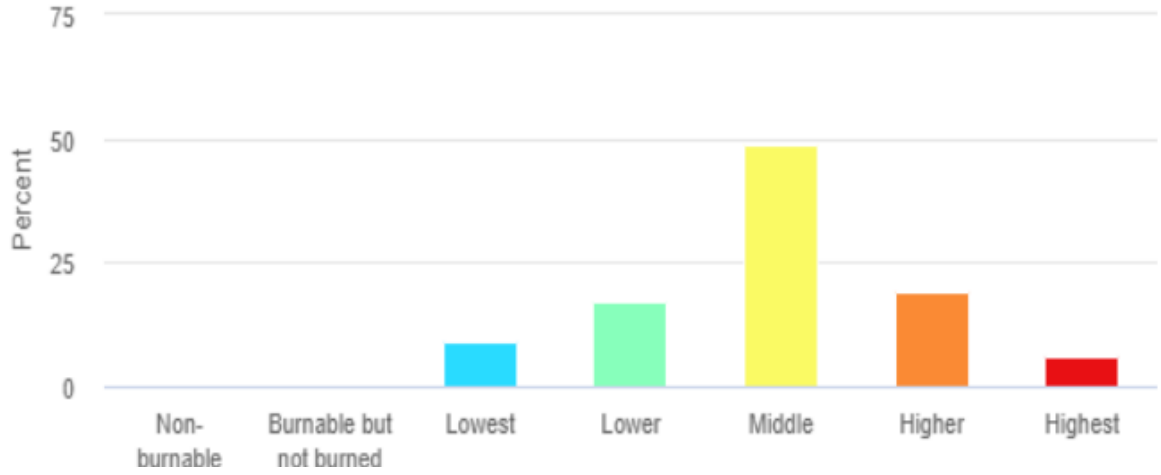


Burn Probability
(Analysis maximum = 0.3624)

- Non-burnable
- Burnable but not burned
- Lowest (0-20% of maximum)
- Lower (20-40% of maximum)
- Middle (40-60% of maximum)
- Higher (60-80% of maximum)
- Highest (80-100% of maximum)

Burn Probability Data Summary for Area of Interest "stagecoach_propertybound_final" within "Discovery/Stagecoach" Landscape

Landscape Name: Discovery/Stagecoach
Landfire Version: LF 2014
Landscape Acres (unbuffered): 23,104
Area of Interest Name: stagecoach_propertybound_final
Area of Interest Acres: 6,433
Model Name: Burn Probability Final
Analysis Maximum Burn Probability: 0.3614



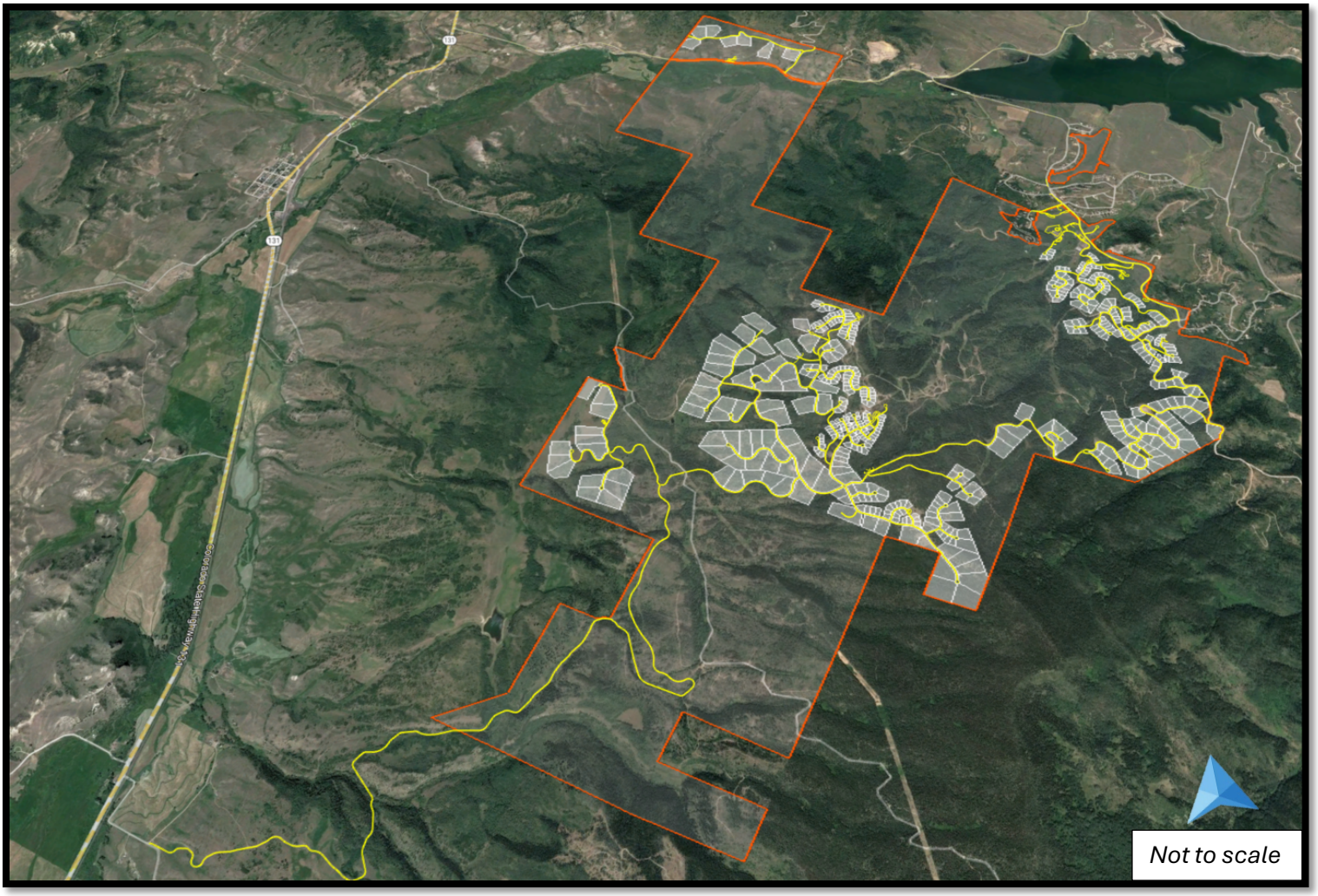
Wildfire Risk Assessment

Wildfire risk hazard assessment is a critical process aimed at understanding and mitigating the potential impacts of wildfires on communities and ecosystems. This assessment involves analyzing various factors such as vegetation types, topography, climate conditions, and historical fire data to identify areas at high risk of wildfires. Advanced modeling techniques and geographic information systems (GIS) are employed to map fire-prone regions and predict fire behavior under different scenarios. The assessment also considers human activities, infrastructure vulnerability, and potential impacts on public health and safety. From the comprehensive assessment and the understanding of wildfire risks an assessment is developed to create effective mitigation strategies, land-use planning, emergency preparedness, and resource allocation, ultimately enhancing community resilience and reducing the adverse effects of wildfires. Attached in Appendix B is the SMR Wildfire Risk Assessment derived from the Colorado Forest Atlas.

Emergency Evacuation

Evacuation and routing of the public during an emergency will be coordinated with Routt County Evacuation Planning and the Office of Emergency Management. Emergency evacuation routes for the project consist of:

- County Road 16, providing emergency egress routes to the south towards Highway 134 or to the west to County Road 14. Evacuees traveling west can continue further west along County Road 14 to Highway 131 and the Town of Oak Creek or north to Steamboat Springs.
- County Road 285 and the creation of a new evacuation road connecting to the proposed project, providing emergency egress routes to the south towards Highway 131. Evacuees traveling north can continue to the Town of Oak Creek or north to Steamboat Springs. Evacuees traveling south can continue to Yampa.



REQUIRED ACTIONS, GUIDELINES & PROCEDURES

The following actions, guidelines, and procedures will be required in the SMR project) to achieve the objectives and fulfill the strategies identified above. These actions are in addition to all required Building Codes that have been adopted and amended by Routt County, including but not limited to 2021 Edition of the International Wildland-Urban Interface Code (IWUIC) Sections 501.1, 503.2, 504.2, 504.2.1, 504.3, 504.4, and 504.10. SMR will be responsible for Design Guidelines within the Project and will adopt the following to minimize wildfire risks.

Structural

- **Building Addressing:** Must follow Oak Creek Fire Protection Districts addressing requirements.
- **Roof:** See IWUIC Chapter 5 Section (504.2. and 504.2.1). Plug openings in roofing materials, such as the open ends of barrel tiles, to prevent ember entry and debris accumulation. Regardless of the type of roof, keep it free of bird's nests, fallen leaves, needles and branches.
- **Eaves:** See IWUIC Chapter 5 Section (504.3).
- **Exterior Siding:** Noncombustible siding. Recommended to use IWUIC Chapter 5 Section (504.5)
- **Rain Gutters:** See IWUIC Chapter 5 Section (504.4). Always keep rain gutters free of bird's nests, leaves, needles, and other debris. Roof gutters shall be provided with a means to prevent accumulation of leaves, needles, and debris. Check and clean them several times during the year.
- **Vent Screening to include foundation and deck:** Screen attic roof eaves and foundation vents recommended 1/8-inch metal mesh. See IWUIC Chapter 5 Section 504.10
    - Vents installed in both residential and commercial buildings for new construction or additions shall be installed in accordance with the items listed below. 1. Foundation wall, vertical exterior wall, or roof vents shall not exceed 144 square inches each, such vents shall be covered with non-combustible corrosion-resistant mesh with openings not to exceed ¼" or shall be designed and approved to prevent flame or ember penetration into the structure. 2. Single Soffit Vents shall not exceed 144 square inches each, such vents shall be covered with non-combustible corrosion-resistant mesh with openings not to exceed ¼" or shall be designed and approved to prevent flame or ember penetration into the structure. 3. Continuous Soffit Vents shall not exceed 2 ½" in width and shall be covered with noncombustible corrosion resistant mesh with openings not to exceed ¼" or shall be designed and approved to prevent flame or ember penetration into the structure.
- **Siding Clearance:** Create 6 inches of vertical clearance between the ground and home siding.

- **Combustible Fencing:** Replace combustible fencing or gates at least within 5 feet of the home.
- **Noncombustible Zone:** Avoid anything combustible within the first five feet surrounding any structure and attached deck, including woody plants, mulch, woodpiles, combustible trellises, and stored items. Use this area for walkways or hardscaping with pavers, rock mulch, decomposed granite, or pea gravel.
- **Chimney Screening:** Screen chimney and stovepipe openings with an approved spark arrestor cap with a 1/2-inch screen.
- **Window Installation:** Recommend installing windows that are at least double-glazed. The type of window frame (e.g., wood, aluminum, or vinyl) is less critical; however, vinyl frames should have metal reinforcements to prevent melting in extreme heat. Keep skylights free of leaves and other debris and remove overhanging branches. If using skylights in the Wildland Urban Interface (WUI), they must be flat skylights constructed of double-pane glass and kept free of vegetation.

Requirements for Access Roads

Requirements for access roads in new developments to ensure that emergency vehicles can effectively reach properties during wildfires. Here are the key requirements:

Access:

- **Construction and Maintenance of New Access/Egress Road:** The creation of a continuous road constructed from the mountaintop to HWY 131 to the West. The road must have a perpetual maintenance cost plan to ensure viability in all seasons. This roadway must be in place and functional before any development within the SMR boundary.
- **General Requirement**: All new subdivisions and developments must provide access roads that meet the requirements **of** OCFPD to ensure proper access for emergency vehicles. See Appendix D
- **Minimum Width**: Access roads must adhere to OCFPD roadway requirements to accommodate emergency vehicles. See Appendix D
- **Minimum Vertical Clearance**: Access roads must have an unobstructed vertical clearance of not less than 13 feet 6 inches.
- **Surface Requirements**: Access roads must be designed and maintained to accommodate emergency vehicles. See Appendix D

- **Maximum Grade**: The grade for access roads must not exceed 10%. See Appendix D

- **Turning Radius**: The turning radius for access roads must meet OCFPD roadway requirements to accommodate emergency vehicles. See Appendix D
- **Dead-End Roads**: Dead-end access roads more than 150 feet must meet OCFPD roadway requirements to accommodate emergency vehicles. See Appendix D

- **Load Capacity**: Bridges or elevated surfaces that provide access to properties must be constructed in accordance with the currently adopted building code and must be designed to support the imposed loads of fire apparatus.

- **Road Markings**: Access roads meet OCFPD roadway requirements. See Appendix D

Additional Considerations

- **Secondary Access**: In some cases, secondary access roads may be required to provide adequate routes for evacuation and emergency response.
- **Road Maintenance**: Regular maintenance of access roads is required to ensure they always remain passable by emergency vehicles.

These requirements ensure that emergency responders can access properties quickly and safely during wildfires, significantly improving the chances of protecting lives and property.

Defensible Space and Structure Ignition Zone

Creating defensible space around your home or structure involves working outwards from the building. Remember, preparing for wildfire is not a one-time effort; it requires ongoing maintenance to give your home the best chance of surviving a wildfire. The following Defensible Space and Structure Ignitions Zone requirements must be adhered to throughout the project and must be included as Regulations in the CCNR's and/or any governing body having jurisdiction over the SMR project area.

The Structure Ignition Zone:

The two primary determinants of a structure's ability to survive a wildfire are the ignitability and the quality of the surrounding defensible space. Together, these two factors create the concept called the structure ignition zone, which includes the structure and the area around it.

To reduce wildfire hazards to structures and property, the most effective actions to take are minimizing the ability of the home/structure to ignite during a wildfire and reducing or eliminating nearby fuel

Defensible Space Zones:

Defensible space is the area around a home or structure that has been modified to reduce fire hazards. In this area, natural and man-made fuels are treated, cleared, or reduced to slow the spread of wildfire. Establishing a defensible space reduces the likelihood of a structure igniting by direct contact with flame or by exposure to the radiant heat of the fire. It also helps limit the local production of embers and reduces the chance that a structure fire will spread to neighboring homes/structures or surrounding vegetation.

Creating an effective defensible space involves establishing a series of management zones around each building on your property, including detached garages, storage buildings, barns, and other structures.

Zone 1 (0-5 feet from the home or structure)

This is the area nearest the home and other structures, focusing on intense fuel reduction to protect against ember attacks.

- Use gravel, pavers, or concrete instead of combustible mulch.
- Clear dead weeds, grass, and debris; check roofs, gutters, and outdoor areas.
- Keep branches trimmed 10 feet away from chimneys and stovepipes.
- Minimize combustible items like furniture and planters on decks.
- Replace combustible fencing and gates with fire-resistant materials.

Zone 2 (5-30 feet from the home or structure)

This is the area transitioning away from the home where fuels should be reduced.

- Clear all dead plants, grass, and weeds.
- Regularly trim trees to maintain a 10-foot gap from others.
- Prune flammable plants and shrubs.
- Clear flammable vegetation and items from under decks, balconies, and stairs.
- Maintain space between trees, shrubs, and flammable items like patio furniture and wood piles.
- Ensure outbuildings and LPG tanks have 10 feet of clear space to bare soil and no flammable vegetation within an additional 10 feet around them.

Zone 3 (30-100 feet from the home or structure)

This is the area farthest from a home or structure. It extends 100 feet from the home or structure on relatively flat ground.

- Space out shrubs and trees horizontally.
- Ensure vertical spacing between grass, shrubs, and trees.
- Trim tree branches up to at least 6 feet from the ground.

- Increase vertical space between shrubs and trees to prevent fire from climbing. Use a formula for vertical spacing: Multiply shrub height by 3 for clearance.

Ongoing Maintenance Guidelines:

The structure ignition zone / defensible space requires regular ongoing maintenance to be effective. Trees, grasses, and shrubs continue to grow, die, and drop leaves each season, and there are ongoing maintenance needs for any structures. Follow these steps to maintain the structure ignition zone.

Top Priorities for Structural Ignitability:

- Ensure the roof has a Class A fire rating.
- Remove all leaves, needles, and other debris from decks, roofs, and gutters.
- Screen attic, roof, eaves, and foundation vents with 1/8-inch metal mesh.
- Screen or wall-in stilt foundations and decks with 1/8-inch metal mesh.
- Use tempered glass for windows; two or more panes are recommended.
- Create 6 inches of vertical clearance between the ground and home siding.
- Replace combustible fencing or gates at least within 5 feet of the home.

Top Priorities for Defensible Space:

- Mow grass and weeds to a height of 4 inches or less.
- Rake and remove all pine needles and other flammable debris from a 5-foot radius around the foundation of your home and deck.
- Treat or mow shrubs that re-sprout aggressively (such as Gambel oak) every 3-5 years or more depending on growth rates.
- Remove branches that hang over the roof and chimney.
- Dispose of slash from thinning trees and shrubs by chipping, hauling to a disposal site, or piling in open areas for burning later. Any accumulation of slash that's chipped or otherwise should be isolated 30 feet or more from the home.
- Avoid creating continuous areas of wood chips on the ground when chipping logs and/or slash. Break up the layer of wood chips by adding nonflammable material or allowing for wide gaps of at least 3 feet between chip accumulations. Address as needed more than once a year.
- Aggressive Shrub Management**:** Treat or mow shrubs that re-sprout aggressively (such as Gambel oak) every 3-5 years or more depending on growth rates.

Firewood:

- Keep firewood stacked uphill from (or at the same elevation as) any structures and keep the woodpile at least 30 feet away from the home.
- Do not stack firewood between remaining trees, underneath a deck, or on a deck.
- Remove flammable vegetation within 10 feet of woodpiles.

Propane Tanks:

- Keep aboveground tanks at least 30 feet from the home, preferably on the same elevation as the house.
- Remove flammable vegetation within 10 feet of all propane tanks and gas meters.

Driveways:

- Maintain a buffer zone free of combustible vegetation along both sides of the driveway. This zone is typically 10-15 feet wide.
- Regularly trim grass, shrubs, and trees to reduce fuel load.
- Remove dead or dry vegetation, fallen leaves, and other debris that could ignite.

Tree and Shrub Spacing:

- Space trees and large shrubs adequately to prevent fire from jumping from plant to plant. This usually means a separation of 10-15 feet between tree canopies.
- Prune lower branches of trees up to 6-10 feet above the ground to prevent ground fires from reaching the tree canopy.

Ground Cover and Mulch:

- Use non-combustible ground cover materials such as gravel or stone instead of bark or wood chips.
- Maintain ground cover to prevent erosion but avoid highly flammable materials.

Fire-Resistant Plants:

- Incorporate fire-resistant plants in the landscaping. These plants typically have high moisture content and are less likely to ignite.
- Avoid highly flammable plants like certain conifers, eucalyptus, and some ornamental grasses.

Water Supply and Hydrants:

- Ensure there is adequate water supply for firefighting purposes. This may include installing fire hydrants or water tanks within a certain distance of structures.
- Maintain clear access to these water sources.

Signage and Address Markers:

- Clearly mark the property address with reflective or non-combustible materials to help emergency responders locate the property quickly.
- Signage should be visible from the road and maintained regularly.
- Signage must comply with OCFPD regulations.

Non-Combustible Materials:

- Use non-combustible materials for driveway construction and edging, such as concrete, asphalt, or gravel.
- Avoid using wood or other flammable materials in proximity to the driveway.

Landscaping Guidelines

- **Low-Flammability Plants:** Only use plant species listed in the Low-Flammability Landscape Plants tables for landscaping and plantings (see Appendix A, Low Flammability Landscape Plants).
- **Shrub Spacing:** Space shrubs apart at least two-and-a-half times their mature height as measured from the edge of the shrubs.
- **Tree Crown Spacing:** Maintain at least 10 feet between tree crowns.
- **Vegetation Characteristics:** Ornamental and wildland vegetation should be carefully spaced, low-growing, well-watered, and free of resins, oils, and waxes that burn easily.
- **Fire-Free Zone:** Create a "fire-free" area within five feet of the home using non-combustible landscaping materials and/or high-moisture-content annuals and perennials.
- **Regular Watering:** Water vegetation and mulch regularly to the extent that vegetation does not dry or wilt.
- **Cluster Spacing:** Leave 30 feet between clusters of two to three trees or 20 feet between individual trees.
- **Vegetation Breaks:** Create breaks in vegetation, such as driveways, gravel walkways, and lawns.

Hot Work

In accordance with the International Fire Code, all hot work performed in Oak Creek Fire Protection District must be performed under a Hot Work Permit in accordance with NFPA 51B *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work,* issued by Oak Creek Fire Protection District. The work is authorized by the Fire Chief or designee only after meeting with the requestor and inspecting the site regarding equipment, location, condition scope, and duration of the work.

Hot work encompasses welding and allied processes, heat treating, grinding, thawing pipe, powder-driven fasteners, hot riveting, torch-applied roofing, and similar operations producing a spark, flame, or heat.

The hot work permit must be posted at the site before and during any hot work. The requestor must ensure that all conditions of the issued permit are addressed before starting work and do not change as the work progresses. If the work or conditions do change, the requestor must stop and contact

the Oak Creek Fire Protection District for a review/re-inspection and possible modification of the permit for re-issuance. Permits may extend to multiple days. The area of the permit is inspected daily by the requestor.

A fire watch is required during the permitted operation and for at least one-half hour after the operation ceases, as determined by the permit. The length of time the fire watch is required will be not only marked on the permit, but also verbally communicated to the requestor.

Continuously monitor weather conditions and fire danger index. Pay particularly wind speed and direction, which can exacerbate fire spread. Suspend hot work if wind conditions are unfavorable and, if fire danger index level is extreme. In addition, if a Red Flag Warning is issued by the National Weather Service or if Routt County enters into fire restrictions all Hot Work must cease.

The area of hot work will be non-combustible, fire-resistive construction, essentially free of combustibles and flammables, suitably segregated from adjacent areas, and equipped with fire extinguishers.

Fuels Mitigation and Vegetation Management Plan

Stagecoach Mountain Ranch project, situated in Routt County, is an area characterized by diverse vegetation and varying topography. Effective vegetation management is crucial for reducing wildfire risks, maintaining ecosystem health, and promoting sustainable land use. A vegetation management plan must be developed and implemented for each phase and the evacuation routes of the Stagecoach Mountain Ranch project and obtain OCFPD's approval. Each plan outlines the strategies and practices necessary to manage vegetation effectively in and around the specific phase of the project, ensuring the safety and resilience of the community.

Objectives:

1. **Reduce Wildfire Risk**: Minimize the potential for wildfires through strategic vegetation management.
2. **Promote Ecosystem Health**: Maintain and enhance native plant communities and biodiversity.
3. **Protect Property and Infrastructure**: Safeguard homes, businesses, and critical infrastructure from fire hazards.
4. **Protect all Ingress and Egress Routes (Evacuation Routes)**: Maintain viable access and egress on all roadways by maintaining and creating shaded fuel breaks.
5. **Enhance Aesthetic and Recreational Value**: Preserve the natural beauty and recreational opportunities in the area.

Assessment of Current Vegetation:

1. **Vegetation Types**: Identify dominant vegetation types, including forests (coniferous and deciduous), shrublands, grasslands, and riparian areas.

2. **Fuel Loads**: Assess current fuel loads and distribution, focusing on areas with heavy accumulation of dead or dense vegetation.
3. **Fire History**: Review historical wildfire occurrences and their impacts on local vegetation and communities.
4. **Ecological Health**: Evaluate the overall health of the vegetation, including the presence of invasive species, disease, and pest infestations.

Vegetation Management Strategies:

1. **Defensible Space Creation**:
    - **Zone 1 (0-30 feet from structures)**: Remove all dead vegetation, trim tree branches to a minimum of 10 feet above the ground, and maintain well-irrigated, fire-resistant landscaping.
    - **Zone 2 (30-100 feet from structures)**: Thin trees and shrubs to create spacing between crowns, remove ladder fuels, and maintain low ground cover.
    - **Zone 3 (100+ feet from structures)**: Manage vegetation to reduce fuel continuity, focusing on thinning and prescribed burns where appropriate.
2. **Fuel Reduction Treatments**:
    - **Mechanical Thinning**: Use chainsaws, masticators, and other equipment to reduce vegetation density, especially in overgrown forests and shrublands.
    - **Prescribed Burns**: Implement controlled burns to reduce fuel loads, mimic natural fire regimes, and promote healthy vegetation regeneration.
    - **Grazing**: Utilize managed grazing by livestock to control grass and shrub growth in appropriate areas.
3. **Invasive Species Control**:
    - Identify and eradicate invasive plant species that can alter fire behavior and outcompete native vegetation.
    - Use a combination of mechanical removal, herbicides, and biological controls as needed.
4. **Riparian Area Management**:
    - Protect and restore riparian zones to maintain water quality, reduce erosion, and support diverse plant and animal life.
    - Remove invasive species and replant native vegetation along waterways.
5. **Community Education and Engagement**:
    - Educate residents and property owners about fire-wise landscaping and vegetation management practices.
    - Encourage community involvement in vegetation management projects, including volunteer fire mitigation efforts and local stewardship programs.

Monitoring and Maintenance:

1. **Regular Inspections**: Conduct periodic inspections of managed areas to assess the effectiveness of treatments and identify new problem areas.

2. **Adaptive Management**: Adjust management practices based on monitoring results, changing environmental conditions, and advances in best practices.
3. **Long-Term Sustainability**: Ensure ongoing funding and resources for vegetation management activities, including grants, partnerships, and community support.

Emergency Preparedness:

1. **Evacuation Plans**: Develop and disseminate clear evacuation plans and routes for residents in case of a wildfire.
2. **Fire Breaks**: Establish and maintain fire breaks in strategic locations to slow the spread of wildfires and protect critical infrastructure.
3. **Collaboration with Fire Authorities**: Work closely with local fire departments, state agencies, and federal land managers to coordinate vegetation management and fire response efforts.

Vegetation Management Conclusion

Implementing this vegetation management plan will help reduce wildfire risks, protect property and lives, and promote a healthy, resilient ecosystem in Stagecoach, CO. Ongoing community involvement, regular monitoring, and adaptive management are essential to the success of this plan.

Conclusion

The Stagecoach Mountain Ranch Wildfire Protection Plan represents the cornerstone of stakeholder's commitment to creating a fire-resilient community within Stagecoach Mountain Ranch. This document serves as the overarching framework and requirements, providing a comprehensive strategy for safeguarding homes, structures, environment, and livelihoods against the threat of wildfires. Recognizing the dynamic nature of fire risk and the diverse landscape of our region, this plan will be implemented in phases, each accompanied by tailored fuels management plans. Through collaborative efforts and proactive measures, we aim to mitigate the potential impacts of wildfires, fostering a safer and more resilient future for all residents of Stagecoach Mountain Ranch.

Appendices

Appendix A. Low Flammability Landscape Plants

Appendix B. Wildfire Risk Assessment

Wildfire Hazards

The wildfire hazard assessment tiers to the Fire Intensity Scale (FIS) component of the State of Colorado's Wildfire Risk Assessment (CO-WRA, 2022). The FIS layer maps relative classes of predicted wildfire intensities based on the combination of fuel hazards and fire behavior. FIS comprises four (4) classes of wildfire intensity and includes:

> Class 1, Lowest: Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
>
> Class 2, Low: Small flames, usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
>
> Class 3, Moderate: Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
>
> Class 4, High: Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.

Appendix C. 2022 Colorado Wildfire Risk Assessment Summary Report

Appendix D. Oak Creek Fire Prevention Services Administrative Policy and Procedure Manual

COLORADO STATE UNIVERSITY EXTENSION

COLORADO STATE FOREST SERVICE

Low-Flammability Landscape Plants

Fact Sheet 6.305 | Wildfire Mitigation Series, Landscaping and Planting

By S. Carter, N. Goeckner, C. Julian (CSFS), L. Langelo, I. Shonle and C. Dennis (Emeritus CSFS) (4/23)

Introduction

In Colorado, in the wildland-urban interface (WUI), it isn't a matter of if a wildfire will impact residences and properties, but when. The WUI includes any areas where structures and other human developments meet or intermingle with wildland vegetative fuels, including grasses, shrubs and trees. Wildfires are a natural part of Colorado's varied ecosystems. Planning ahead and taking action to reduce the risk of wildfires can increase the likelihood a home survives when wildfires do occur. Firefighters do their best to protect residents, but ultimately, it's your responsibility to protect your property and investments from wildfire.

This fact sheet is a part of a series of three publications created to help homeowners focus on actions that are effective in reducing wildfire hazards on properties. These efforts should always begin with the home or structure itself and progress outward. Defensible space is the area around a home or other structures that has been modified to reduce fire hazards by creating space between potential fuel sources.

In the defensible space, natural and man-made fuels are treated, removed or reduced to slow the spread of wildfire and alter fire behavior. Plants that are low flammability are selected for planting, especially closer to the home.

Creating an effective defensible space involves establishing a series of management zones. Develop these zones around each building, including detached garages, storage buildings, barns and other structures. Recognize that fuel continuity and density play a critical role in wildfire behavior. Zones are defined from the structure edge in feet:

- **Zone 1: 0-5 feet**
- **Zone 2: 5-30 feet**
- **Zone 3: 30-100 feet**

This fact sheet covers plants in zones 1 and 2; a different publication; the Fire-Resistant Landscaping fact sheet, discusses plants in zone 3. For a defensible space plan for properties, contact the nearest Colorado State Forest Service field office or local CSU-Extension office for guidance. Consult with a forester, fire department staff or community organization appropriately trained in wildfire mitigation practices.

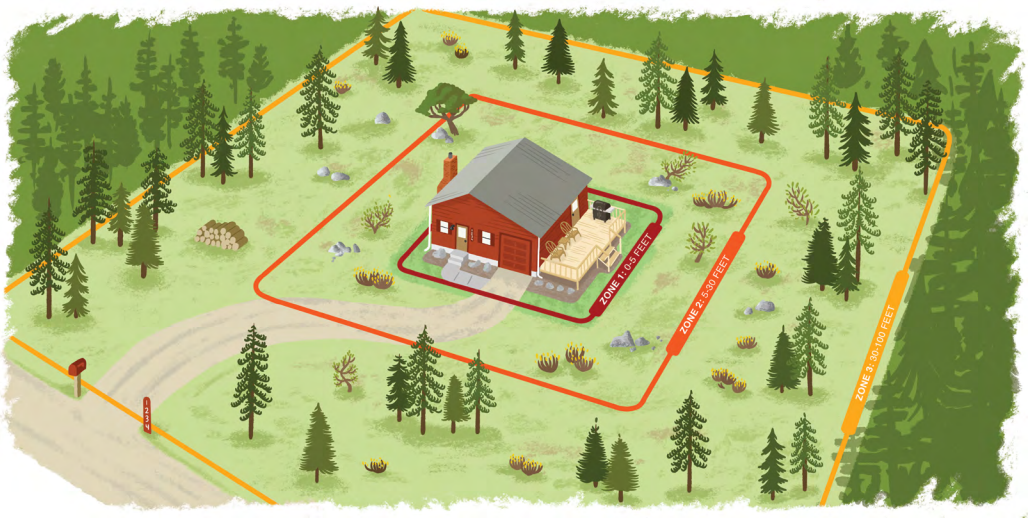


Illustration: Bonnie Palmatory, Colorado State University

Quick Facts

- The right plants around structures are important for wildfire safety.
- Management of defensible space and plant types is essential.
- This fact sheet is one of a series of three.
- Plants rated 10 have the least flammability.
- This fact sheet recommends low-flammability plants for zones 1 and 2.
- Refer to the Colorado State Forest Service's Home Ignition Zone guide for further details on home ignition zones.

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04/2023

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Low-Flammability Plant Characteristics

Recommendations on this list are based on a methodology developed by Idaho Firewise in Boise, Idaho. The methodology rates the flammability of plants based on specific characteristics ranked on a scale of 0-10 with 0 the most flammable and 10 the least flammable. To create the highest degree of protection for structures, the recommendation is to plant only plants with scores of 8, 9 and 10 for zones 1 and 2 within the first 30 feet from the home. These species are the least flammable plants to plant near structures, but keep in mind that there are no truly "fireproof" plant species. Existing vegetation with scores below an 8 (indicating more flammability) is addressed in the Fire-Resistant Landscaping fact sheet (6.303). Plants that have lower flammability and are more resistant to wildfire and plants that have a higher flammability and are less resistant to wildfire have these specific characteristics:

Attributes that decrease flammability

- **Low oil or resin content**
- **High moisture content**
- **Soap, latex or pectin content**
- **Compact growth form**
- **Green stems**
- **Drought tolerant**

Attributes that increase flammability

- **High oil or resin content**
- **Low moisture content**
- **Tall growth**
- **Open form**
- **Fine wood (twiggy) stems**
- **High water need**

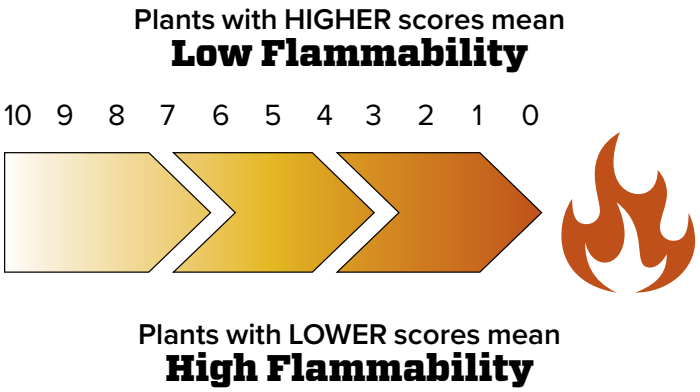
Many plants are highly flammable during different seasons of the year. At such times, left unmanaged, they can accelerate the spread of a wildfire that can harm communities. All vegetation, naturally occurring and otherwise, is potential fuel for fire. Its type, amount and arrangement have a dramatic effect on fire behavior.

There are no "fireproof " plant species. Plant choice, spacing and maintenance are critical to reduce the risk adjacent to the structure.

There are many concepts to consider when choosing low-flammability plants. A plant's moisture content is the single most important factor governing its volatility. However, resin content and other factors in some species render them flammable even when the plant is well watered. Conifers tend to be flammable due to their oil and pitch content, regardless of their water content. Deciduous plants tend to be more fire resistant because their leaves have higher moisture content and their basic chemistry is less flammable. Also, when deciduous trees are dormant, there is less fuel to carry fire through their canopies.

In some cases, there is a strong correlation between drought tolerance and fire resistance. These plants offer less fuel or have a higher moisture content, both of which help reduce fire hazard. There also appears to be a correlation between a plant's salt tolerance and natural fire resistance. Plants adapted to salty conditions, and actually growing in salty situations, may better resist burning.

Most of Colorado's native vegetation is adapted to fire and is flammable. Common flammable plants have flammability scores less than 8. Common flammable trees are junipers, pines, firs and spruces. Common flammable shrubs are Gambel oak, three-leaf sumac and mountain mahogany. Planting of these species is discouraged adjacent to the home in defensible space zones 1 and 2. If they're already present, consider replacing them with some of the recommended species included in this fact sheet. If you decide to keep a flammable plant in your landscape, keep it pruned and thinned, remove dead material regularly, and keep it at least 30 feet from any structure or other plants. See the Fire-Resistant Landscaping fact sheet (6.303) for more information on these mitigation measures.



Don't Forget Maintenance

A landscape is a dynamic, constantly changing system. Plants considered "fire resistant" and that have low amounts of flammable vegetation can lose these characteristics over time. Your landscape, and the plants in it, must be maintained to retain their low-flammability properties. Maintenance is addressed in further detail in the Fire-Resistant Landscaping fact sheet (6.303).

Supporting Publications from CSU Extension, the Colorado State Forest Service and Idaho Firewise

The following publications are available and are referenced. The CSFS Home Ignition Zone (HIZ) guide describes the concepts of structural ignitability and defensible space. Low-Flammability Landscape Plants (6.305) recommends fire-resistant plants for zones 1 and 2 identified in the defensible space section of the CSFS HIZ guide. Fire-Resistant Landscaping (6.303) recommends design features for zones 1, 2 and 3 and recommends plants with mitigation measure for plants and existing vegetation in zone 3.

The CSFS HIZ guide, Low-Flammability Landscape Plants and Fire-Resistant Landscaping are considered a package that can help with developing actions to reduce wildfire risk and impacts. The Idaho materials provided the basis for the addition of the flammability scoring and approach for this update.

1. CSFS Home Ignition Zone Guide, 2021 (Replaces 6.302, Creating Wildfire-Defensible Zones) *https://bit.ly/COHomeIgnitionZone*

2. 6.303, Fire-Resistant Landscaping (Updated 2023) *https://bit.ly/FireResistantLandscaping*

3. Idaho Firewise, Fire-Resistant Landscapes – Plant Materials *https://idahofirewise.org/firewise-landscapes/firewise-plant-materials/*

Opuntia (Photo by I. Shonle)

Rocky Mountain Penstemon (Photo by I. Shonle)

Purple Ice Plant (Photo by S. Carter)

KEY				
Water Needs	VL = very low	L = low	M = medium	H = high
Sun/Shade	S = sun	PS = part sun	Sh = shade	Prt Sh = part shade

Native, low-water plants

Native, low-water flowers and ground covers

Scientific Name	Common Name	Approx. Water Needs	Sun/Shade Preference	Approx. Mature Height	Flower Color	Elevation in 1,000' Increments	Approx. Bloom Time	Low Flammability Rating
Achillea lonulosa, now A. millefolium	common yarrow	**L-H**	**S/PS**	1.5-2'	white	5-10 K	Jul	9.5
Allium cernuum	nodding onion	**L-H**	**S/PS**	1'	pink/purple	5-10 K	Jun	10
Allium geyeri	Geyer's onion	**L-H**	**S/PS**	1'	pink	5-10 K	Jun	10
Antennaria parvifolia	small-leaf pussytoes	**M**	**S/PS**	<.5'	creamy white	5-10 K	Jun	8
Antennaria rosea	rosy pussytoes	**M**	**S/PS**	<.5'	rose	5-10 K	Jun	8
Aquilegia chrysantha	golden columbine	**M-H**	**S/PS**	1-2'	yellow	5-10 K	Jun-Aug	8
Asclepias tuberosa	common butterfly weed	**L**	**S**	1-2'	orange	5-6 K	Summer	8
Symphyotrichum (f. Aster) laeve	smooth aster	**L-H**	**S/PS**	1-3'	blue/ lavender	5-10 K	Aug-Sep	8
Symphyotrichum (f. Aster) porteri	porter aster	**L-M**	**S**	1'	white	5-10 K	Aug-Sep	8
Astragalus utahensis	Utah milkvetch	**L**	**S**	.5'	pink/purple	5-6 K	Spring	8
Callirhoe involucrata	poppy mallow	**L**	**S**	5"	pink/white	5-8 K	Summer	8
Calochortus gunnisonii	Gunnison's mariposa lily	**M-H**	**S**	.5-2'	white	5-10 K	Jul-Aug	8
Campanula rotundifolia	harebell; bluebells of Scotland	**M-H**	**S**	.5-1'	blue	5-10 K	May-Oct	9.5
Claytonia lanceolata	western spring beauty	**M**	**Sh**	.5-1.5'	white	5-10 K	Mar-Apr	9.5
Coreopsis tinctoria	plains coreopsis	**L-M**	**S**	2.5-3'	yellow	5-9 K	Summer	8
Erysimum capitatum	western wallflower	**M**	**S/PS**	1'+	yellow	5-10 K	Jun-Jul	9
Gaillardia aristata	blanketflower	**L-M**	**S**	1-1.5'	yellow-reddish	5-10 K	Jul-Sep	8
Galium boreale	northern bedstraw	**M-H**	**Sh**	<1'	white	5-10 K	May-Jun	8
Geranium caespitosum	Rocky Mountain geranium	**M**	**Sh/PS**	2'	pink/purple/ white	5-10 K	May-Oct	8
Geum triflorum	prairie smoke	**M-H**	**S/PS**	1.5'	reddish pink	5-10 K	Jun	8
Leucocrinum montanum	sand lily	**L-M**	**S**	<1'	white	5-8 K	May	10
Linum lewisii	Lewis or blue flax	**L**	**S**	2.5'	blue	5-8 K	Late Spring-Early Summer	8
Lupinus argenteus	silvery lupine	**M**	**Sh/PS**	1-3'	blue	5-10 K	Jun-Jul	8
Mertensia lanceolata	prairie bluebell	**M**	**Sh/PS**	1-2'	blue	5-10 K	May-Jun	10

Scientific Name	Common Name	Approx. Water Needs	Sun/Shade Preference	Approx. Mature Height	Flower Color	Elevation in 1,000' Increments	Approx. Bloom Time	Low Flammability Rating
Native, low-water flowers and ground covers cont.								
Oenothera speciosa	evening primrose	**L-M**	**S**	1-1.5'	white-pink	4-7 K	May-Jul	8
Penstemon caespitosus	mat penstemon	**L-M**	**S**	<.5'	purple	5-10 K	Jun	8
Penstemon secundiflorus	sidebells penstemon	**L-M**	**S**	1-2'	blue/violet/ pink	5-9 K	May-Jun	8
Penstemon teucrioides	germander beardtongue	**L-M**	**S**	.5'	purple/ violet	5-10 K	Jun-Jul	8
Penstemon spp.	penstemon species, cultivars	**L-M**	**S**	1-2.5'	blue/purple/ violet	5-9 K	Summer	8
Penstemon strictus	Rocky Mountain penstemon	**L-M**	**S**	2-2.5'	purple/ violet	5-10 K	May-Jul	8
Penstemon virens	Front Range beardtongue	**M**	**S/PS**	.5'	blue	5-10 K	May-Jun	8
Sedum lanceolatum	yellow stonecrop	**M**	**S/PS**	.5'	yellow	5-10 K	Jul-Aug	10
Thermopsis rhombifolia var. divaricarpa	spreadfruit golden banner	**M-H**	**S/PS**	2'	yellow	5-10 K	May	8
Native, low-water shrubs, trees and cacti								
Amelanchier alnifolia v. utahensis	Utah serviceberry	**VL-M**	**S**	4-6'	white	5-7 K	May	7.5
Cylindropuntia spp.	Cholla	**VL-M**	**S**	3-5'	pink	5-6 K	Jun	8
Opuntia spp.	prickly pear	**VL**	**S**	.5-1'	yellow/pink	5-7.5 K	May	10
Philadelphus lewisii	Cheyenne mock orange	**M**	**S**	2-3'	white	5-9 K	Jun	8
Populus tremuloides	aspen	**M**	**S**	8-25'	catkins	5-10 K	n/a	9
Rhus glabra	smooth sumac	**L**	**S**	3-5'	yellow	5-8 K	Apr	8
Rhus trilobata 'Autumn Amber'	Autumn Amber sumac	**L**	**S/PS**	1'	yellow	5-7.5 K	Apr	8
Symphoricarpos albus	snowberry	**M**	**S/PS**	2-3'	white/pink	5-9 K	n/a	8
Yucca baccata	banana yucca	**VL-L**	**S/PS**	2-3'	white	5-6 K	Jun	8
Yucca glauca	soapweed, Great Plains yucca	**VL-L**	**S/PS**	2-3'	white	5-7 K	Jun	8
Non-native, low-water plants								
Non-native, low-water flowers and ground covers								
Aegopodium podagraria "Variegatum"	variegated bishop's weed, goutweed	**M**	**S/PS**	8"	white	5-8 K	not showy	8
Ajuga reptans	bugleweed	**H**	**Sh**	<.5'	blue	5-10 K	Jun-Jul	8
Alchemilla mollis	Lady's mantle	**M-H**	**PS/Sh**	1'	yellow	5-9 K	Jun-Jul	8
Arabis spp.	rockcress	**L-H**	**S**	<1'	white	5-10 K	May-Jun	8
Armeria maritima	sea thrift	**L-H**	**S/PS**	.5'	white	5-10 K	Apr-Jun	8
Aubrieta spp.	false rockcress	**M**	**S**	1'	pink/white/ purple	5-9 K	Apr-May	8
Aurinia saxatilis	basket of gold	**M**	**S/PS**	1'	yellow	5-9 K	Apr-May	8

Scientific Name	Common Name	Approx. Water Needs	Sun/Shade Preference	Approx. Mature Height	Flower Color	Elevation in 1,000' Increments	Approx. Bloom Time	Low Flammability Rating
Non-native, low-water flowers and ground covers cont.								
Bergenia cordifolia	heartleaf bergenia, pigsqueak	**M**	**PS/Sh**	1'	pink/purple	5-9 K	Spring	8
Centranthus ruber	Jupiter's beard	**L-H**	**S/Sh**	2-2.5'	red	5-9 K	May-Oct	10
Cerastium alpinum v. lanthanum	alpine mouse-ear	**M**	**S/PS**	1'	white	5-10 K	May-Jun	8
Cerastium tomentosum	snow-in-summer	**L-M**	**S/PS**	1'	white	5-9 K	May-Jun	8
Ceratostigma plumbaginoides	plumbago	**L**	**S/Sh**	.5'	blue	5-6 K	Fall	8
Convallaria majalis	Lily-of-the-valley	**H**	**Sh**	<1'	white	5-9 K	May-Jun	8
Coreopsis spp.	tickseed, coreopsis	**M**	**S**	1.5-2'	yellow	5-8 K	Summer	8
Delosperma nubigenum	hardy yellow ice plant	**M-H**	**S**	.5'	chartruese-yellow	5-8 K	Jun	10
Delosperma spp.	ice plant	**L**	**S**	1.5-2'	yellow	varies	Spring	10
Dianthus spp.	pink	**L-H**	**S**	<.5'-2'	pink	5-10 K	May-Aug	9
Diascia integerrima 'Coral Canyon'	Coral Canyon twinspur	**M**	**S/Prt Sh**	1-1.5'	rose-pink	4-7 K	Summer	9
Doronicum spp.	Leopard's bane	**H**	**S/PS**	2-3'	yellow	5-9 K	Jul-Aug	10
Echeveria spp.	hens-n-chicks	**L**	**S/Prt Sh**	1-2'	varies	5-9 K	Summer	8
Ephedra regeliana	Regel's jointfir	**L**	**S**	6-12"	yellow	5-12 K	Spring	8
Erysimum linifolium	wallflower	**L**	**S**	1-3'	varies	4.5-12 K	Spring-Summer	9
Euonymus fortunei	winter creeper	**M**	**S/Prt Sh**	3'	green-white	4.5-8 K	Spring	8
Euphorbia polychroma	cushion spurge	**L**	**S**	12-18'	yellow	5-8 K	Spring	10
Euphorbia × martini 'Mini Martini'	Martini's spurge	**L-H**	**S**	1.5-2'	chartruese	4-6 K	Late Spring	10
Fragariaspp.	wild strawberries	**M**	**S/Prt Sh**	.25-.75"	white	5-11 K	Summer	9
Geranium spp.	hardy geraniums	**M**	**Sh/PS**	2'	blue/pink/purple/white	5-10 K	May-Oct	8
Helianthemum nummularium	rockrose, sunrose	**M-H**	**S**	<1'	pink	5-8 K	May-Jun	8
Hemerocallis sp.	daylilies	**L-M**	**S/PS**	1-3'	yellow/red/orange	5-7.5 K	Summer	10
Iberis sempervirens 'Little Gem'	Little Gem evergreen	**M**	**S**	.5-1'	white	4.5-9 K	Spring	8
Iris germanica	bearded iris	**L-M**	**S**	1-3'	numerous colors	5-10 K	May-Jun	8
Kniphofia uvaria	red hot poker	**L**	**S**	3'	red/yellow	5-6 K	Summer	8
Lamium spp.	spotted deadnettle	**M-H**	**Sh**	<1'	white/purple/pink	5-10 K	May-Jun	8
Lilium spp.	lilies	**M**	**S/Prt Sh**	1-8'	varies	4-6.5 K	Summer	10
Lupinus spp.	lupine	**L-M**	**S/PS**	2-3'	lavender blue	5-10 K	Summer	8
Marrubium rotundifolium	silver-edged horehound	**VL-L**	**S**	1.5-2.5'	white	5-6 K	Early Summer	8

Scientific Name	Common Name	Approx. Water Needs	Sun/Shade Preference	Approx. Mature Height	Flower Color	Elevation in 1,000' Increments	Approx. Bloom Time	Low Flammability Rating
Non-native, low-water flowers and ground covers cont.								
Muscari armeniacum	grape hyacinth	**M**	**S/PS**	6-9"	blue	4.5-10 K	Spring	10
Nierembergia gracilis 'Starry Eyes'	Starry Eyes' cupflower	**M**	**S**	10"	purple (lt. lav.)	4.5-5.5 K	Summer/ Late Summer	8
Nierembergia repens	creeping white cup	**M-H**	**S/PS**	2-4"	white	4.5-5.5 K	July-Sep	8
Oenothera berlandieri	Berlander's sundrop	**L-M**	**S**	1'	yellow	4.5-6.5 K	Early Summer-Fall	8
Pachysandra terminalis 'Green Sheen'	Green Sheen pachysandra	**M-H**	**Sh**	6-8"	white	4-8 K	April-May	8
Papaver orientale	Oriental poppy	**H**	**S/Sh**	2-3'	orange/ pink/red	5-10 K	May-Jun	9
Polemonium spp.	Jacobs ladder	**H**	**S/PS**	1-2'	blue/white	5-10 K	May-Aug	8
Polygonatum commutatum	great Soloman's seal	**M-H**	**PS/Sh**	2'	white	4-10 K	May-Jun	8
Salvia officinalis	common or garden sage	**L-M**	**S/PS**	2'	blue-lavender/ pink/ lavender	5-8 K	Jun	7.5
Saxifraga hirsuta	saxifrage	**H**	**S/PS**	.5'+	white	5-10 K	May-Jun	8
Scutellaria alpina'Moonbeam'	alpine skullcap	**M**	**S/PS**	.5-1'	white/ purple	4-8 K	May	8
Sedum spp.	stonecrop	**M**	**S/PS**	1-1.5'	yellow	5-10 K	Jul-Aug	10
Sempervivum spp.	hens and chicks, houseleeks	**L-M**	**S/PS**	.5'	pink	5-10 K	n/a	10
Solidago sphacelata 'Golden Fleece'	Golden Fleece goldenrod	**VL-M**	**S**	1-1.5'	yellow	4-8 K	Aug-Sep	8
Thymus serpyllum 'Minus'	Elfin thyme	**L**	**S**	1-3"	pink	4-10 K	Early-Late Summer	8
Trifolium spp.	clover	**M**	**S/PS**	1-2'	white/ purple/pink	varies/spp.	varies: May-Oct	8
Veronica pectinata	woolly creeping speedwall	**L-M**	**S**	<.5'	blue	5-9 K	Apr-Jul	8
Vinca minor	common periwinkle	**H**	**Sh**	<1'	white	5-10 K	Apr-Jun	8
Waldsteinia spp.	Barren strawberry	**M-H**	**Sh/PS**	<1'	yellow	5-9 K	May-Jun	8

Non-native, low-water trees and shrubs								
Berberis thunbergii 'Atropurpurea Nana'	crimson pygmy Japanese barberry	**M**	**S**	2-3'	yellow	5-7.5 K	Spring	8
Ceanothus americanus	New Jersey tea' ceanothus	**M**	**S/PS**	2-3'	white	5-7.5 K	Summer	8
Lonicera tatarica	Tatarian honeysuckle	**M**	**S/PS**	4-6'	white/pink	5-10 K	May-Jun	8
Malus spp.	crabapple	**M**	**S**	10-15'	pink/white	5-9 K	Apr-May	8
Yucca filamentosa	Adam's needle	**M**	**S/PS**	2-3'	white	5-8 K	Jun	8

Scientific Name	Common Name	Approx. Water Needs	Sun/Shade Preference	Approx. Mature Height	Flower Color	Elevation in 1,000' Increments	Approx. Bloom Time	Low Flammability Rating
Turf grasses								
Bouteloua dactyloides	buffalograss	**L**	**S**	mow to 2"	n/a	5-6.5 K	n/a	9
Bouteloua gracilis	blue grama	**L**	**S**	mow to 2"	n/a	4.5-7.5 K	n/a	9
Festuca ovina	sheep fescue	**M**	**S**	mow to 2"	n/a	5-9 K	n/a	9
Lolium perenne	perennial ryegrass	**M**	**S**	mow to 2"	n/a	5-8 K	n/a	10
Poa compressa	Canada bluegrass	**M**	**S**	mow to 2"	n/a	5-8 K	n/a	9
Poa pratensis	Kentucky bluegrass	**M**	**S**	mow to 2"	n/a	5-9 K	n/a	10

Low-flammability plants with higher water needs								
Aconitum columbianum	Columbian monkshood	**M-H**	**S**	2'	blue/purple	5-10 K	Jun-Jul	7.5
Aconitum spp.	monkshood	**M-H**	**S**	2'	blue/purple	5-10 K	Jun-Jul	7.5
Aquilegia caerulea	Colorado blue columbine	**M-H**	**S/PS**	1-2'	blue-lav./ white	5-10 K	Jun-Jul	8
Aquilegia spp.	columbine	**M-H**	**S/PS**	1-2'	varies	5-10 K	Jun-Jul	8
Corylus cornuta	beaked hazelnut	**H**	**S/Sh**	5-6'	yellow-brown	5-7.5 K	inconspicuous	8
Hosta spp.	hosta	**M-H**	**PS**	2-3'	varies	varies	Summer-Fall	8
Iris missouriensis	Missouri or native iris	**M-H**	**S**	1-2'	violet blue	5-10 K	May	9.5

Blue Grama Grass © Larry Allain. USGS NWRC @ USDA-NRCS PLANTS Database

Geranium and Rocky Mountain Columbine (Photo by I. Shonle)

Wallflowers and Blue Mist Penstemons (Photo by I. Shonle)

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Wildfire Hazards

The wildfire hazard assessment tiers to the Fire Intensity Scale (FIS) component of the State of Colorado's Wildfire Risk Assessment (CO-WRA, 2022). The FIS layer maps relative classes of predicted wildfire intensities based on the combination of fuel hazards and fire behavior. FIS comprises four (4) classes of wildfire intensity and includes:

- Class 1, Lowest: Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
- Class 2, Low: Small flames, usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
- Class 3, Moderate: Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
- Class 4, High: Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.

2022 Colorado Wildfire Risk Assessment Summary Report

COLORADO STATE FOREST SERVICE
COLORADO STATE UNIVERSITY

Stagecoach mt Ranch 2

Report was generated using
www.ColoradoForestAtlas.org

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Introduction

Colorado Wildfire Risk Assessment Report

Welcome to the Colorado Wildfire Risk Assessment Summary Reporting Tool.

This tool allows users of the Risk Reduction Planner application of the Colorado Forest Atlas web portal to define a specific project area and generate information for this area. A detailed risk summary report can be generated using a set of predefined map products developed by the Colorado Wildfire Risk Assessment project which have been summarized explicitly for the user defined project area. The report is generated in PDF format.

The report has been designed so that information from the report can be copied and pasted into other specific plans, reports, or documents depending on user needs. Examples include, but are not limited to, Community Wildfire Protection Plans, Local Fire Plans, Fuels Mitigation Plans, Hazard Mitigation Plans, Homeowner Risk Assessments, and Forest Management or Stewardship Plans. Example templates for some of these reports are available for download on the Colorado Forest Atlas web portal.

The Colorado WRA provides a consistent, comparable set of scientific results to be used as a foundation for wildfire mitigation and prevention planning in Colorado.

Results of the assessment can be used to help prioritize areas in the state where mitigation treatments, community interaction and education, or tactical analyses might be necessary to reduce risk from wildfires.

The Colorado WRA products included in this report are designed to provide the information needed to support the following key priorities:

- Identify areas that are most prone to wildfire
- Plan and prioritize hazardous fuel treatment programs
- Allow agencies to work together to better define priorities and improve emergency response, particularly across jurisdictional boundaries
- Increase communication with local residents and the public to address community priorities and needs

Products

Each product in this report is accompanied by a general description, table, chart and/or map. A list of available Colorado WRA products in this report is provided in the following table.

COWRA Product	Description
Wildland Urban Interface	Housing density depicting where humans and their structures meet or intermix with wildland fuel
Wildland Urban Interface Risk	A measure of the potential impact on people and their homes from wildfire
Wildfire Risk to Assets	The overall composite risk occurring from a wildfire derived by combining Burn Probability and Values at Risk Rating
Burn Probability	Annual probability of any location burning due to wildfire
Terrain Difficulty Index	Reflects the difficulty to suppress a fire given the terrain and vegetation conditions that may impact ground resource access and capabilities
Characteristic Flame Length	A measure of the expected flame length of a potential fire
Fire Intensity Scale	Quantifies the potential fire intensity by orders of magnitude
Fire Type	Potential for canopy fire type for extreme weather conditions (canopy fire potential)
Rate of Spread	The speed with which a fire moves in a horizontal direction across the landscape
Surface Fuels	Characterization of surface fuel models that contain the parameters for calculating fire behavior outputs
Vegetation	General vegetation and landcover types
Watershed Protection Risk	A measure of risk to watershed protection areas based on the potential negative impacts from wildfire.
Riparian Assets Risk	A measure of the risk to riparian areas based on the potential negative impacts from wildfire
Forest Assets Risk	A measure of the risk to forested areas based on the potential negative impacts from wildfire

COWRA Product	Description
Building Damage Potential	Estimates the potential for building loss
Defensible Space Index	The arithmetic mean of the three defensible space components: canopy, fuels, and slope. The colors shown represent the relative range and are the average for all of the buildings in the hexagon.

Wildland Urban Interface

Reflects housing density depicting where humans and their structures meet or intermix with wildland fuels

Colorado is one of the fastest growing states in the Nation, with much of this growth occurring outside urban boundaries. This increase in population across the state will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

The Wildland Urban Interface (WUI) layer reflects housing density depicting where humans and their structures meet or intermix with wildland fuels. In the past, conventional wildland-urban interface data sets, such as USFS SILVIS, have been used to reflect these concerns. However, USFS SILVIS and other existing data sources did not provide the level of detail needed by the Colorado State Forest Service and local fire protection agencies, particularly reflecting encroachment into urban core areas.

For the **Stagecoach mt Ranch 2** project area, it is estimated that **16** people or **100%** percent of the total project area population (16) live within the WUI.

The new WUI data set is derived using advanced modeling techniques based on the Where People Live (housing density) data set and 2021 LandScan USA population count data available from the Department of Homeland Security, HSIP data. WUI is simply a subset of the Where People Live data set. The primary difference is populated areas surrounded by sufficient non-burnable areas (i.e. interior urban areas) are removed from the Where People Live data set, as these areas are not expected to be directly impacted by a wildfire. Fringe urban areas, i.e. those on the edge of urban areas directly adjacent to burnable fuels are included in the WUI. Advanced encroachment algorithms were used to define these fringe areas.

Data is modeled at a 20-meter grid cell resolution, which is consistent with other CO-WRA layers. The WUI classes are based on the number of houses per acre. Class breaks are based on densities well understood and commonly used for fire protection planning.

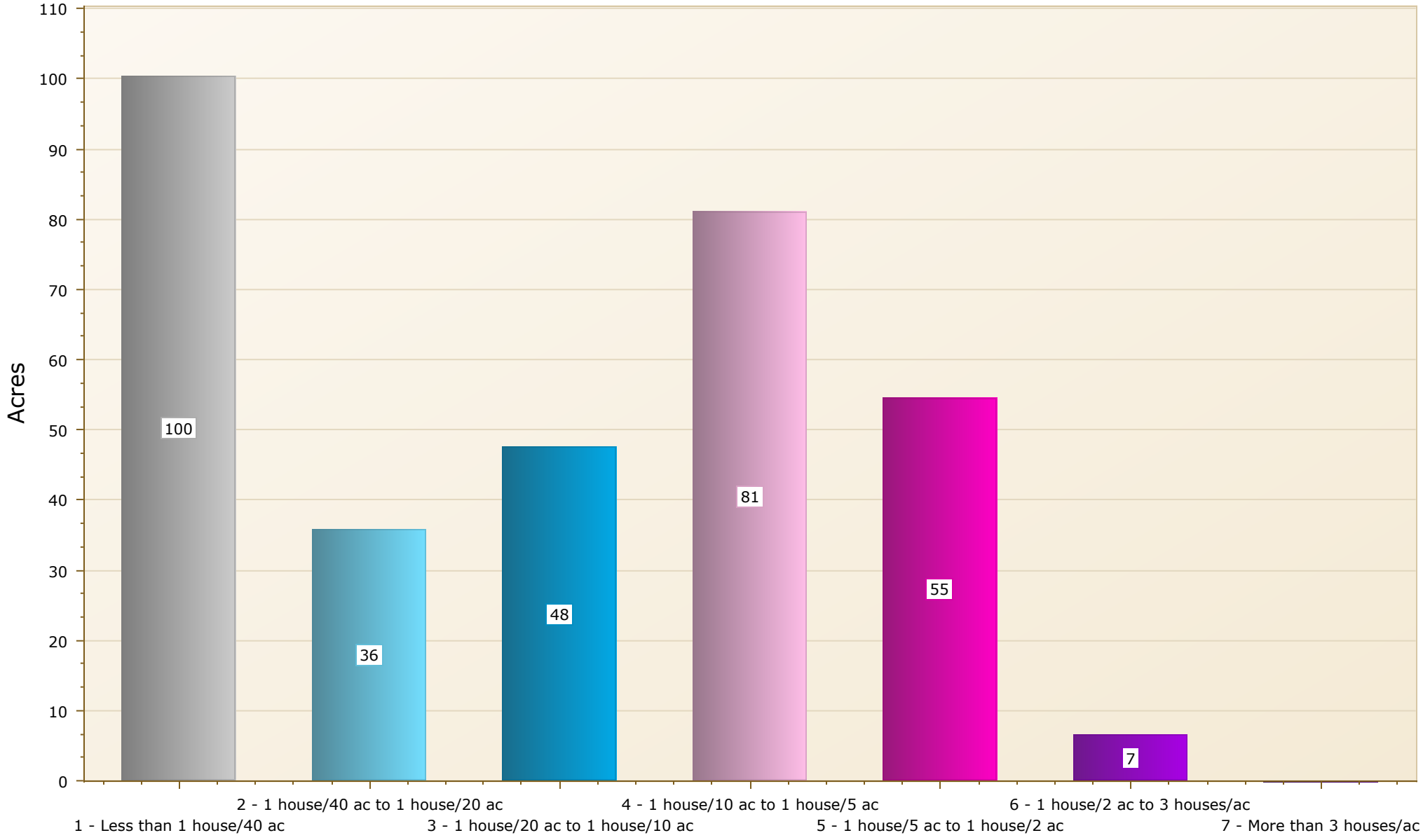
A more detailed description of the risk assessment algorithms is provided in the Colorado Wildfire Risk Assessment (Colorado WRA) Final Report, which can be downloaded from www.ColoradoForestAtlas.com

Housing Density	WUI Population	Percent of WUI Population
1 - Less than 1 house/40 ac	1	6.2%
2 - 1 house/40 ac to 1 house/20 ac	0	0%
3 - 1 house/20 ac to 1 house/10 ac	0	0%
4 - 1 house/10 ac to 1 house/5 ac	10	62.5%
5 - 1 house/5 ac to 1 house/2 ac	5	31.2%
6 - 1 house/2 ac to 3 houses/ac	0	0%
7 - More than 3 houses/ac	0	0%
Total	**16**	**100%**

Housing Density	WUI Acres	Percent of WUI Acres
1 - Less than 1 house/40 ac	100	30.8%
2 - 1 house/40 ac to 1 house/20 ac	36	11%
3 - 1 house/20 ac to 1 house/10 ac	48	14.6%
4 - 1 house/10 ac to 1 house/5 ac	81	24.9%
5 - 1 house/5 ac to 1 house/2 ac	55	16.7%
6 - 1 house/2 ac to 3 houses/ac	7	2%
7 - More than 3 houses/ac	0	0%
None	**326**	**100%**

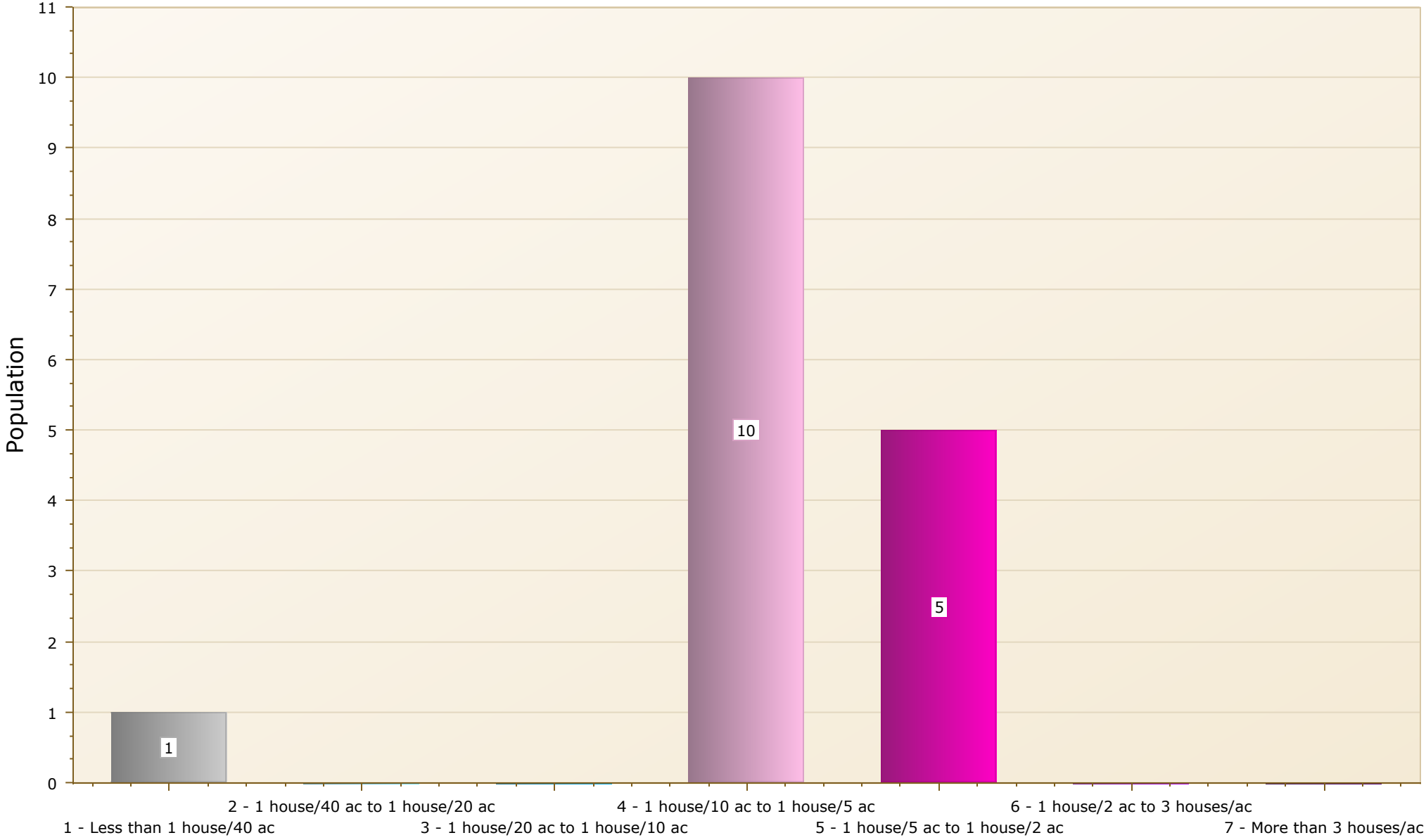
Wildland Urban Interface - Acres

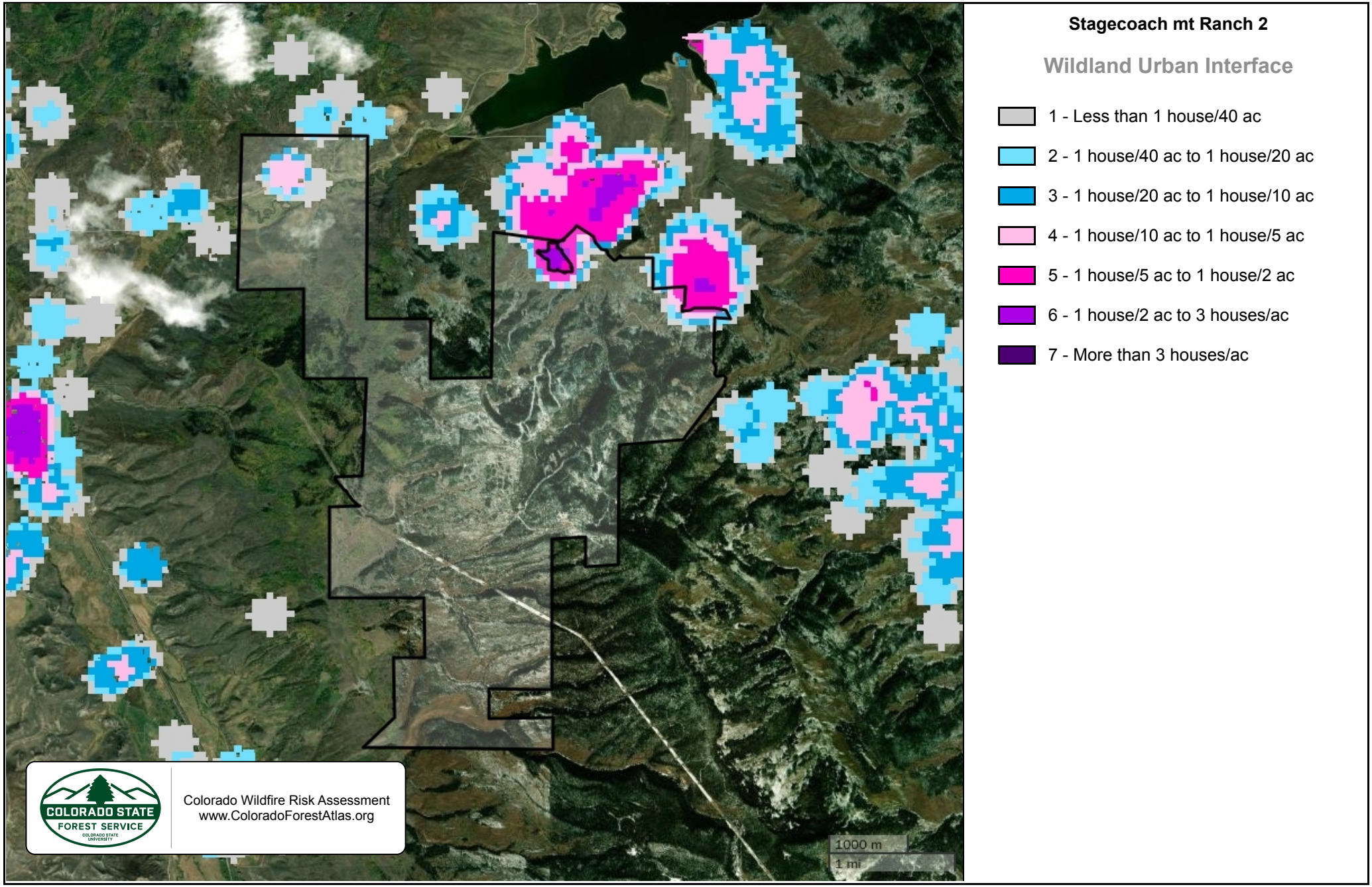
Stagecoach mt Ranch 2



Wildland Urban Interface - Population

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Wildland Urban Interface
1 - Less than 1 house/40 ac
2 - 1 house/40 ac to 1 house/20 ac
3 - 1 house/20 ac to 1 house/10 ac
4 - 1 house/10 ac to 1 house/5 ac
5 - 1 house/5 ac to 1 house/2 ac
6 - 1 house/2 ac to 3 houses/ac
7 - More than 3 houses/ac
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Colorado Wildfire Risk Assessment
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1000 m
1 mi

Wildland Urban Interface (WUI) Risk

The Wildland-Urban Interface (WUI) Risk Index layer is a rating of the potential impact of a wildfire on people and their homes.
The key input, WUI, reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the wildland-urban interface and rural areas is essential for defining potential wildfire impacts to people and homes.

The WUI Risk Index is derived using a response function modeling approach. Response functions are a method of assigning a net change in the value to a resource or asset based on susceptibility to fire at different intensity levels, such as flame length.

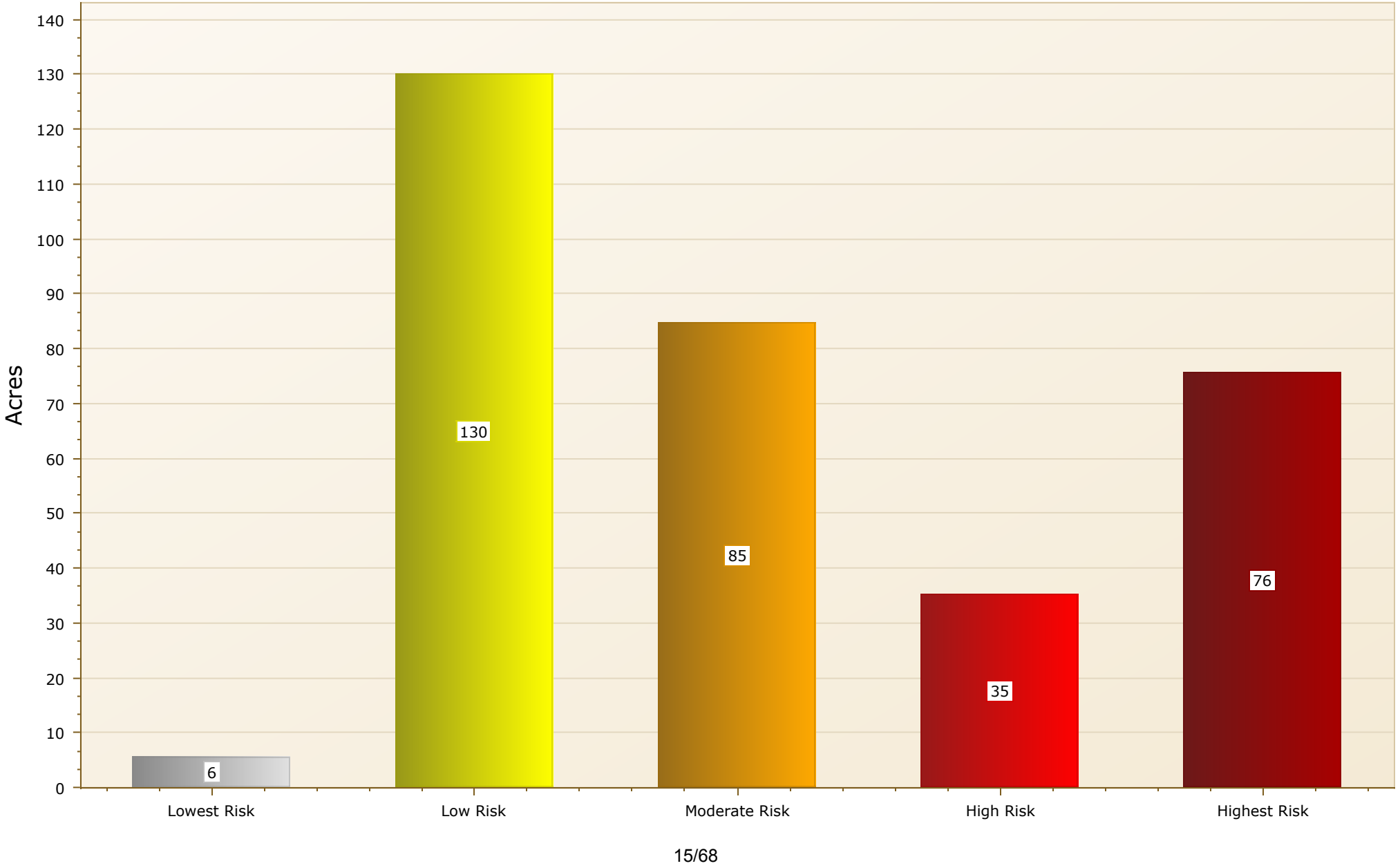
To calculate the WUI Risk Index, the WUI housing density data were combined with flame length data and response functions were defined to represent potential impacts. The response functions were defined by a team of experts led by Colorado State Forest Service mitigation planning staff. By combining flame length with the WUI housing density data, it is possible to determine where the greatest potential impact to homes and people is likely to occur. Customized urban encroachment algorithms were used to ensure those fringe urban areas were included in the WUI Risk outputs. Encroachment distances into urban areas were based on the underlying fuel models and their fuel types and propensity for spotting and spreading.

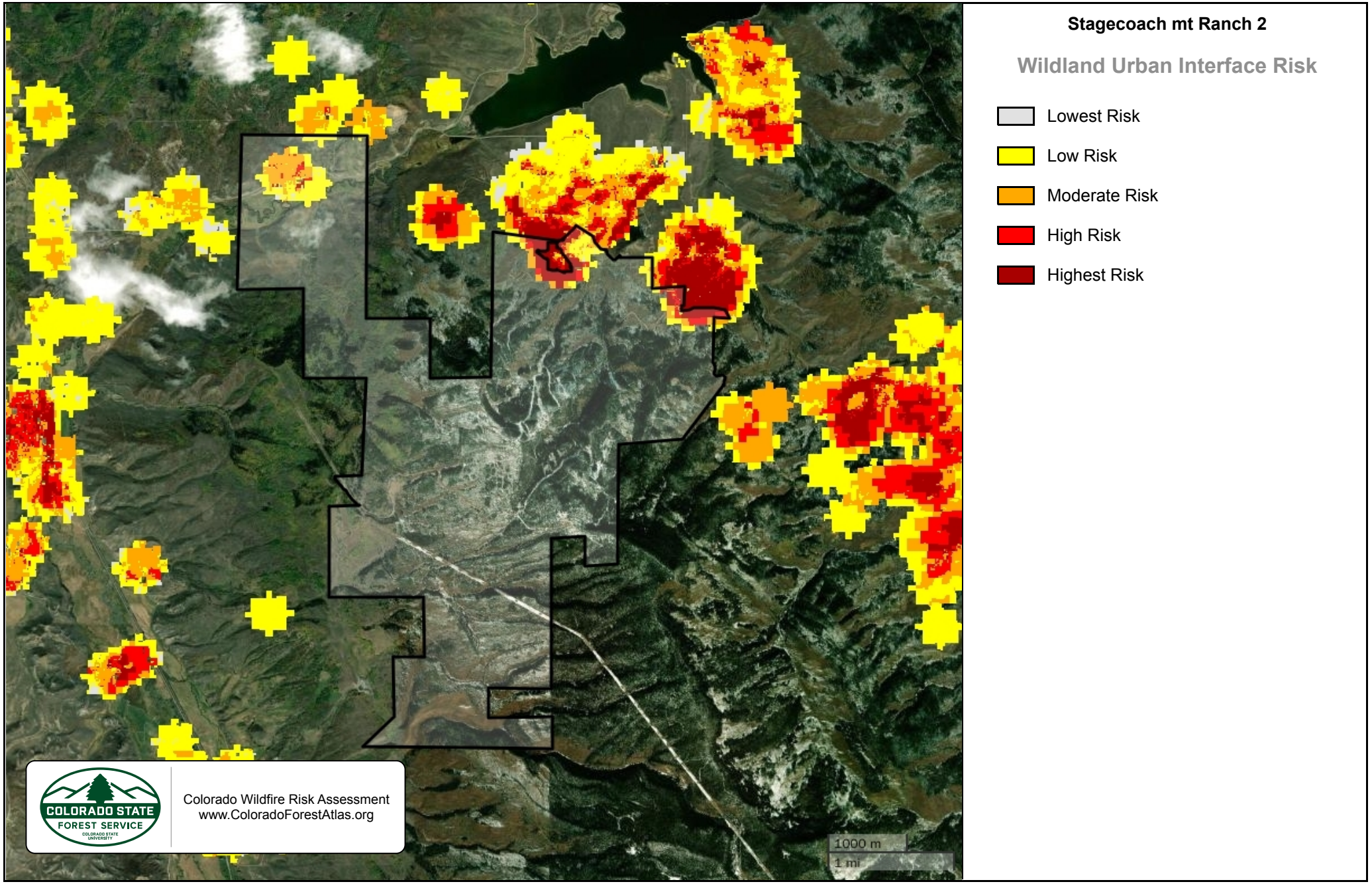
The WUI Risk Index has been calculated consistently for all areas in Colorado, which allows for comparison and ordination of areas across the entire state. Data is modeled at a 20-meter cell resolution, which is consistent with other CO-WRA layers.

WUI Risk Class	Acres	Percent
Lowest Risk	6	1.7%
Low Risk	130	39.2%
Moderate Risk	85	25.6%
High Risk	35	10.6%
Highest Risk	76	22.8%
Total	**332**	**100%**

Wildland Urban Interface Risk

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Wildland Urban Interface Risk
Lowest Risk
Low Risk
Moderate Risk
High Risk
Highest Risk
COLORADO STATE
FOREST SERVICE
Colorado Wildfire Risk Assessment
www.ColoradoForestAtlas.org
1000 m
1 mi

Firewise USA Recognized Sites

Description

Firewise USA® is a national recognition program that provides resources to inform communities how to adapt to living with wildfire and encourages neighbors to take action together to reduce their wildfire risk. Colorado communities that take the following five steps can be recognized as Firewise:

1. Form a Firewise board or committe
2. Obtain a wildfire risk assessment from the CSFS or local fire department, and create an action plan
3. Hold a Firewise event once per year
4. Invest a minimum of $24.14 per dwelling unit in local Firewise actions annually
5. Create a National Fire Prevention Association (NFPA) profile and follow the application directions located at https://portal.firewise.org/user/login

The Firewise USA® dataset defines the boundaries of the recognized communities. Mapping Firewise USA® boundaries will generally be completed by CSFS staff.

Note: These are estimated boundaries using a variety of methods with varying degrees of accuracy. These are not legal boundaries and should not be construed as such. The boundaries may overlap with CWPP areas and are subject to change over time as the communities develop, change, and continue to implement wildfire mitigation efforts.
To learn more about the Firewise USA® recognition program or to fill out an application, visit https://www.nfpa.org/Public-Education/By-topic/Wildfire/Firewise-USA - OR https://csfs.colostate.edu/wildfire-mitigation/colorado-firewise-communities/

The designated area does not contain data for this section.

Community Wildfire Protection Plans (CWPPs)

Description

A Community Wildfire Protection Plan (CWPP) is a document developed and agreed upon by a community to identify how the community will reduce its wildfire risk. CWPPs identify areas where fuels reduction is needed to reduce wildfire threats to communities and critical infrastructure, address protection of homes and other structures, and plan for wildfire response capability. The Colorado State Forest Service (CSFS) supports the development and implementation of CWPPs and provides resources, educational materials and information to those interested in developing CWPPs.

The CWPP dataset represents the boundaries of those areas that have developed a CWPP. Note that CWPPs can be developed by different groups at varying scales, such as county, Fire Protection District (FPD), community/subdivision, HOA, etc., and as such, can overlap. In addition, the CWPPs can be from different dates. Often a county CWPP is completed first with subsequently more detailed CWPPs done for local communities within that county or FPD. CO-WRAP provides a tool that allows the user to select the CWPP area and retrieve the CWPP document for review (PDF).

At a minimum, a CWPP should include:

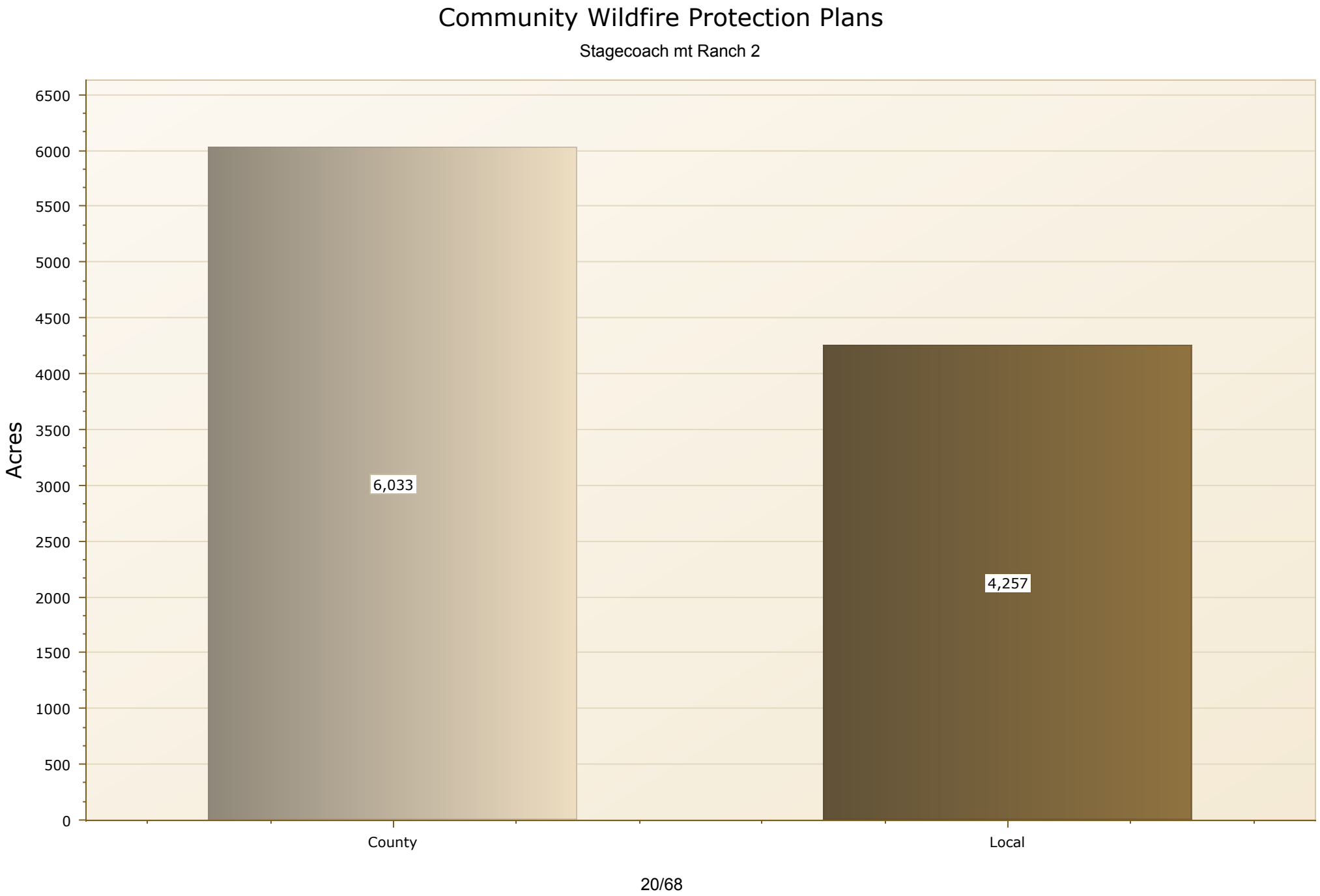
- The wildland-urban interface (WUI) boundary, defined on a map, where people, structures and other community values are most likely to be negatively impacted by wildfire
- The CSFS, local fire authority and local government involvement and any additional stakeholders
- A narrative that identifies the community's values and fuel hazards
- The community's plan for when a wildfire occurs
- An implementation plan that identifies areas of high priority for fuels treatments

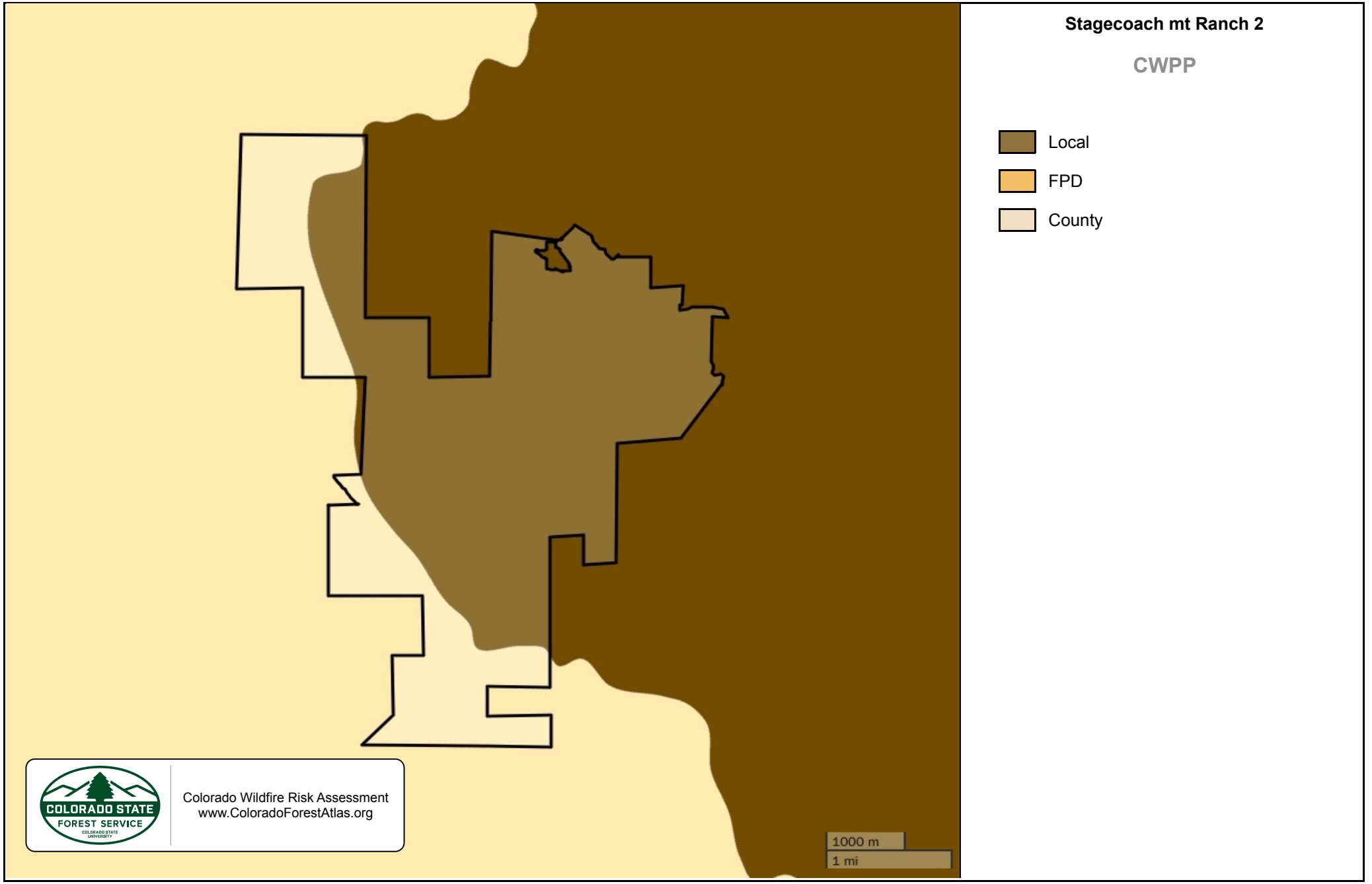
CWPPs are not shelf documents and should be reviewed, tracked and updated. A plan stays alive when it is periodically updated to address the accomplishments of the community. Community review of progress in meeting plan objectives and determining areas of new concern where actions must be taken to reduce wildfire risk helps the community stay current with changing environment and wildfire mitigation priorities.

Community input is the foundation of a Community Wildfire Protection Plan that identfies community needs and garners community support.

If your community is in an area at risk from wildfire, now is a good time to start working with neighbors on a CWPP and preparing forfuture wildfires. Contact your local CSFS district to learn how to start this process and create a CWPP for your community: http://csfs.colostate.edu/pages/your-local-forester.html
For the **Stagecoach mt Ranch 2** test project area, there are 2 CWPPs areas that are totally or partially in the defined project area.

CWPP Name	CWPP Type	CSFS District	Acres inside project area	Total Acres
Routt County	County	Steamboat Springs	6,033	1,516,081
Stagecoach	Local	Steamboat Springs	4,257	55,111
Total Acres			**10,290**	**1,571,192**


Community Wildfire Protection Plans
Stagecoach mt Ranch 2
Acres
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
6,033
4,257
County
Local


Stagecoach mt Ranch 2
CWPP
Local
FPD
County
COLORADO STATE
FOREST SERVICE
COLORADO STATE UNIVERSITY
Colorado Wildfire Risk Assessment
www.ColoradoForestAtlas.org
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1 mi

Wildfire Risk to Assets

Description

Wildfire Risk is a composite risk map created by combining the Values at Risk Rating and the Burn Probability layers.
It identifies areas with the greatest potential impacts from a wildfire – i.e., those areas most at risk when considering the four values layers.

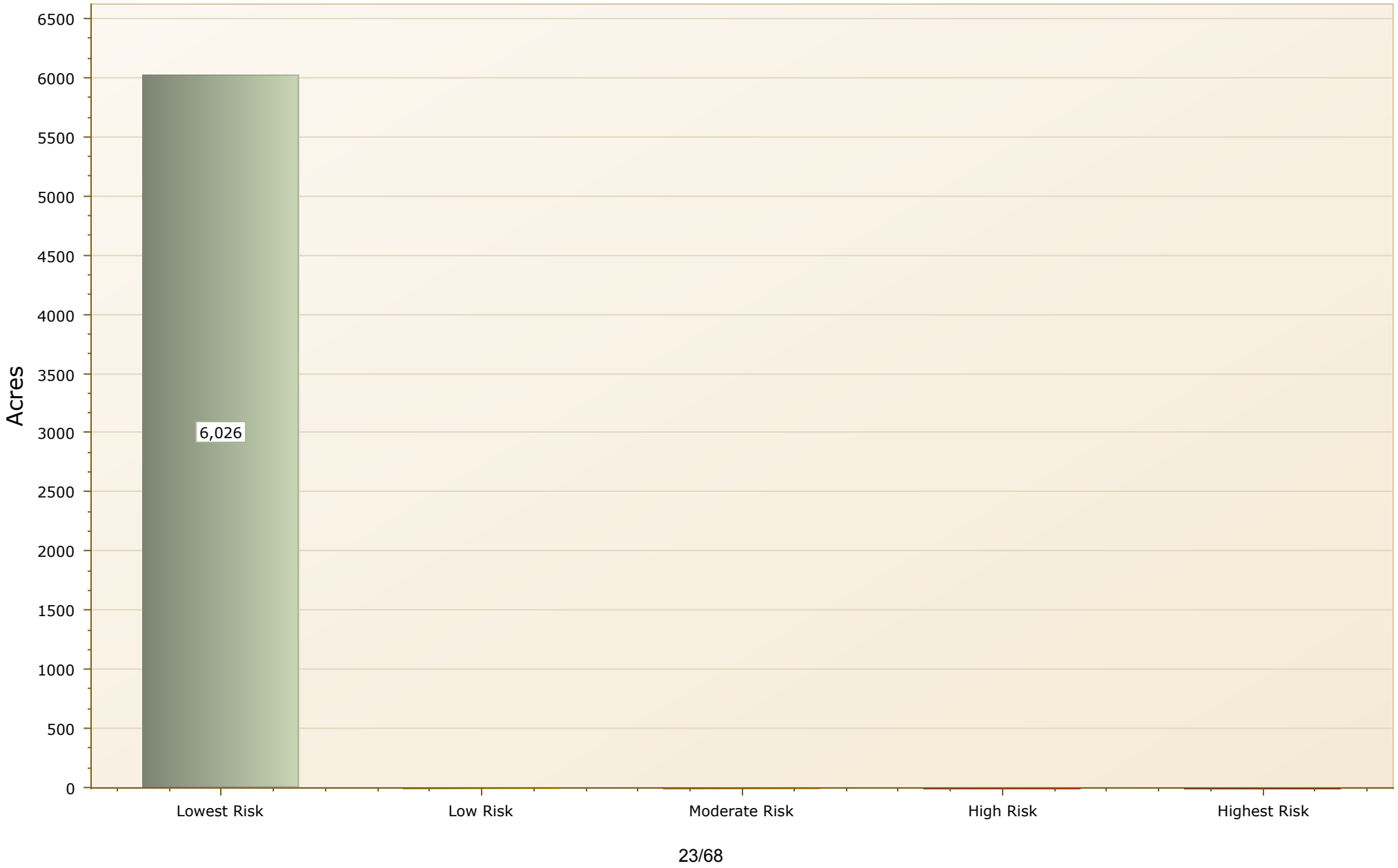
The Values at Risk Rating is a key component of Wildfire Risk. It is comprised of several individual risk layers including Wildland Urban Interface (housing density), Forest Assets, Riparian Assets and Watershed Protection risk outputs. The WUI component is a key element of the composite risk since it represents where people live in the wildland and urban fringe areas that are susceptible to wildfires and damages. The found individual risk layers are weighted to derive the Values at Risk Rating layer.

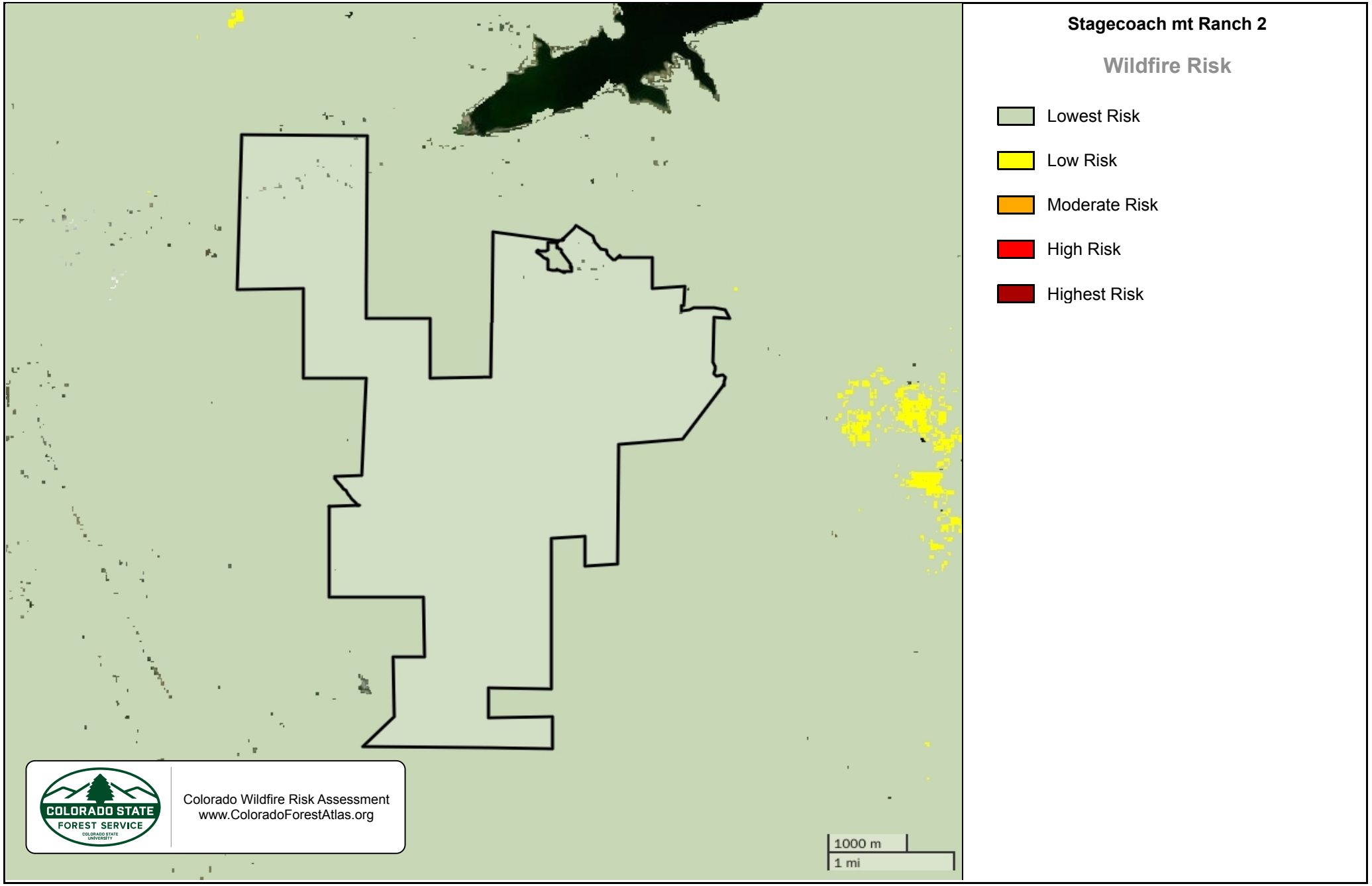
The risk map is derived at a 20-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county, or local planning efforts.

Wildfire Risk	Acres	Percent
Lowest Risk	6,026	100%
Low Risk		0%
Moderate Risk		0%
High Risk		0%
Highest Risk		0%
Total	**6,026**	**100%**

Wildfire Risk to Assets

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Wildfire Risk
Lowest Risk
Low Risk
Moderate Risk
High Risk
Highest Risk
COLORADO STATE FOREST SERVICE
Colorado Wildfire Risk Assessment
www.ColoradoForestAtlas.org
1000 m
1 mi

Burn Probability

Description

Burn Probability (BP) is the annual probability of any location burning due to a wildfire.

The annual BP was calculated as the number of times that a cell was burned and the number of iterations used to run the models. The annual BP was estimated for Colorado by using a wildfire simulation approach with Technosylva's Wildfire Analyst software (Wildfire Analyst). A total number of 2,342,334 fires were simulated (3,200,000 if we consider those fires outside the Colorado border which were used in a buffer area around the study area to compute BP) with a mean ignition density of 8.68 fires/km2. The ignition points were spatially distributed evenly every 500 meters across the state. Only high and extreme weather conditions were used to run the single fires because they usually burn most of the annual burned area. All fires simulations had a duration of 8 h. After simulating all the fires, some cells were not burned by any simulated fire, resulting in a BP value of zero. Some cells were non-burnable due to the associated fuel type (i.e. water, roads, urban, agricultural areas, barren areas). However, the lowest BP value found in "burnable" cells was assigned to cells where the simulated fires did not reach.

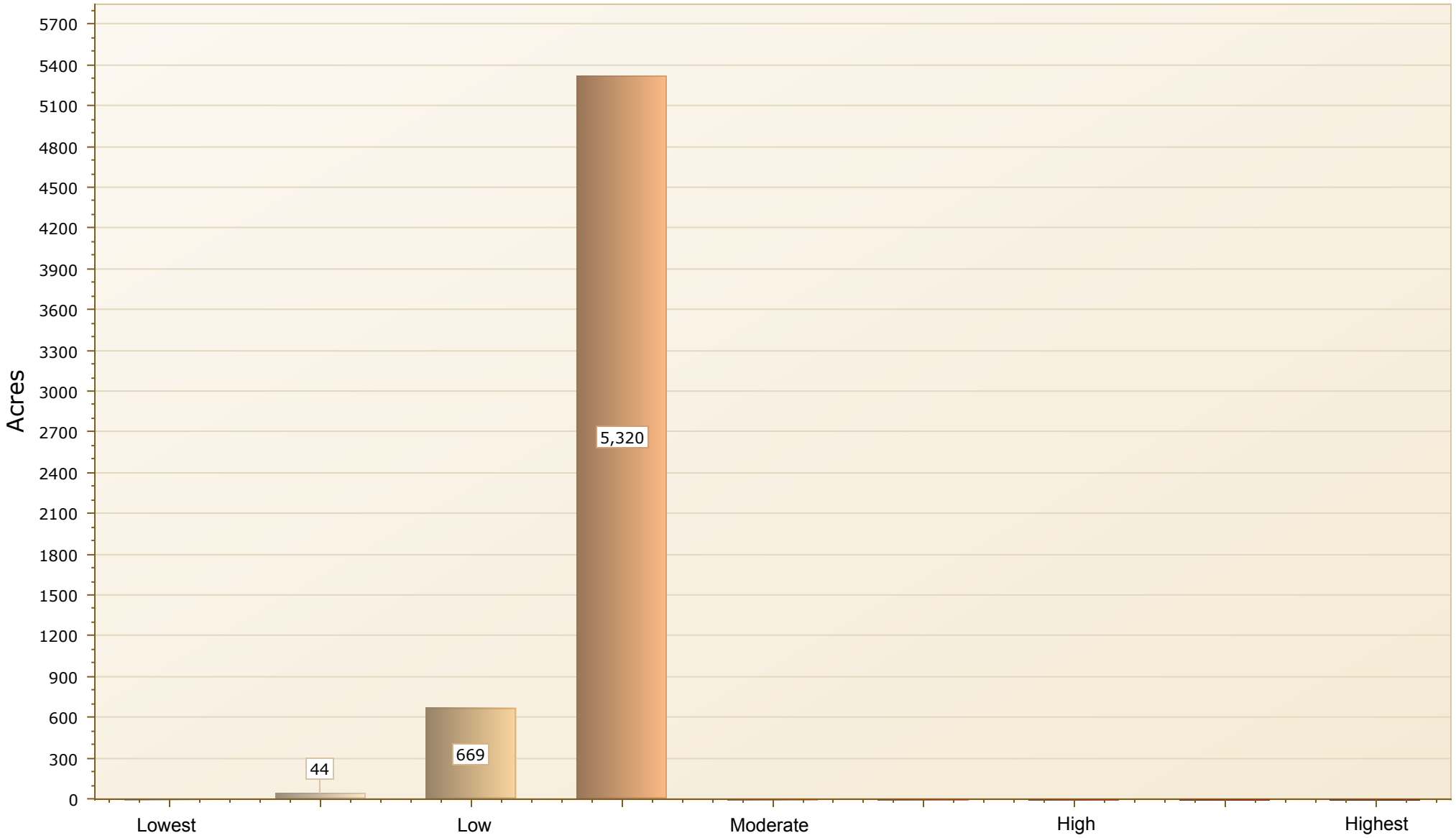
The Wildfire Analyst fire simulator considered the number of times that the simulated fires burned each cell. After that, results were weighted by considering the historical fire occurrence. The weighting was done by assessing the relation between the annual historical fire ignition density in Colorado and the total number of simulated fires with varying input data in high and moderate weather scenarios and the historical spatial distribution of the ignition points.

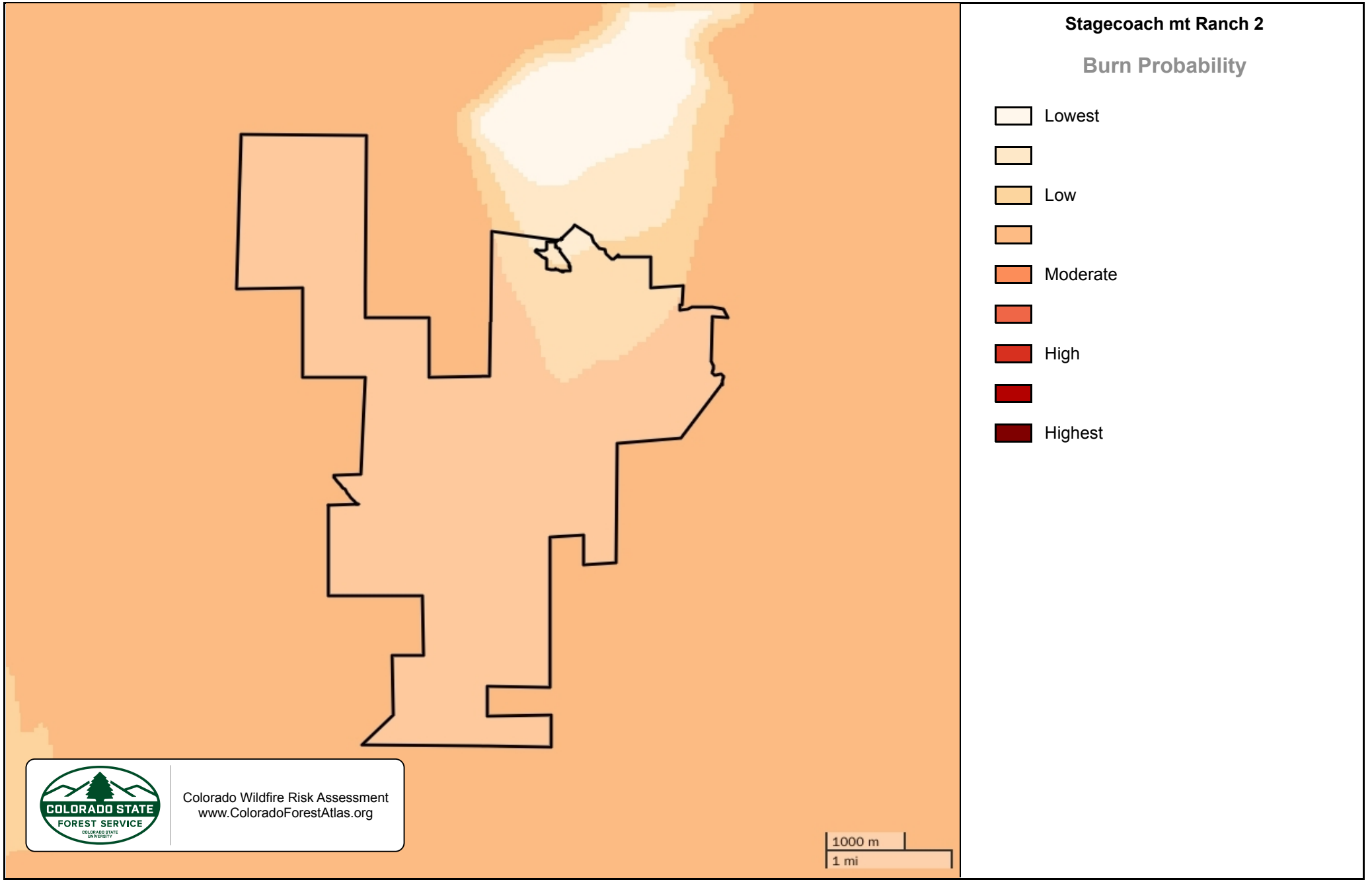
The probability map is derived at a 20-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local protection mitigation or prevention.

Burn Probability	Acres	Percent
Lowest		0%
	44	0.7%
Low	669	11.1%
	5,320	88.2%
Moderate		0%
		0%
High		0%
		0%
Highest		0%
Total	**6,033**	**100%**

Burn Probability

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Burn Probability
Lowest
Low
Moderate
High
Highest
COLORADO STATE
FOREST SERVICE
Colorado Wildfire Risk Assessment
www.ColoradoForestAtlas.org
1000 m
1 mi

Terrain Difficulty Index

Description

The 2012 and 2017 CO-WRA included a simple metric that described suppression difficulty based on fireline dozer rates. For 2022 CO-WRA, this standalone metric has been updated to reflect a more enhanced definition of areas where access to fires and suppression from ground resources is difficult. Although not a component of the standard risk assessment outputs, this metric is provided as it helps inform which areas may have limited suppression capabilities, especially for initial attack, across the State.

The Terrain Difficulty Index (TDI) is a metric that describes the characteristics of the landscape which evaluates the difficulty of extinction, especially in initial attack, although it can also be extrapolated to extended attacks. This static index quantifies the availability of access for the arrival of terrestrial means, the ability to penetrate the area where the fire originates, and the difficulty of extinguishing fuels.

Indicators such as the Accessibility Index, Penetrability Index and Fireline Opening Index (construction) have been used for the formulation of TDI. This index is based on other indices such as the Wildfire Suppression Difficulty Index (terrestrial) (SDIt) (Matthew P Thompson et al, 2018. Francisco Rodriguez and Silva et al, 2020.) which is a quantitative rating of the relative difficulty to perform fire control work. However, TDI is dynamic as it incorporates changes in surface fuels over time providing a less static perspective for a planning point of view.

The designated area does not contain data for this section.

Wildfire Behavior Outputs

Description

Fire behavior is the way a fire reacts to the following environmental influences:

1. Fuels
2. Weather
3. Topography

Fire behavior characteristics are attributes of wildland fire that pertain to its spread, intensity, and growth. Fire behavior characteristics utilized in the Colorado WRA include fire type, rate of spread, flame length and fireline intensity (fire intensity scale). These metrics are used to determine the potential fire behavior under different weather scenarios. Areas that exhibit moderate to high fire behavior potential can be identified for mitigation treatments, especially if these areas are in close proximity to homes, business, or other assets.

Fuels

The Colorado WRA includes composition and characteristics for both surface fuels and canopy fuels. Assessing canopy fire potential and surface fire potential allows identification of areas where significant increases in fire behavior affects the potential of a fire to transition from a surface fire to a canopy fire.

Fuel datasets required to compute both surface and canopy fire potential include:

1.Surface Fuels are typically categorized into one of four primary fuel types based on the primary carrier of the surface fire: 1) grass, 2) shrub/brush, 3) timber litter, and 4) slash. They are generally referred to as fire behavior fuel models and provide the input parameters needed to compute surface fire behavior. The 2022 assessment uses the latest 2022 calibrated fuels for Colorado. The following custom fuels were included to improve the fire modeling in timber, WUI and agricultural areas:

- Timber: 2 new categories (171 and 191)

- Urban: 7 new categories (911,912,913,914,915,916 and 919)

- Roads: 5 new categories (941,942,943,944 and 949)

- Agriculture: 4 new categories (931,932,938 and 939)

- Water: 3 new categories (981,982 and 989)

2. Canopy Cover is the horizontal percentage of the ground surface that is covered by tree crowns. It is used to compute wind-reduction factors and shading.

3.Canopy Ceiling Height/Stand Height is the height above the ground of the highest canopy layer where the density of the crown mass within the layer is high enough to support vertical movement of a fire. A good estimate of canopy ceiling height is the average height of the dominant and co-dominant trees in a stand. It is used to compute wind reduction to mid-flame height, and spotting distances from torching trees.

4.Canopy Base Height is the lowest height above the ground above which sufficient canopy fuel exists to vertically propagate fire (Scott & Reinhardt, 2001). Canopy base height is a property of a plot, stand or group of trees, not an individual tree. For fire modeling, canopy base height is an effective value that incorporates ladder fuels, such as tall shrubs and small trees. Canopy base height is used to determine whether a surface fire will transition to a canopy fire.

5. Canopy Bulk Density is the mass of available canopy fuel per unit canopy volume (Scott & Reinhardt, 2001). Canopy bulk density is a bulk property of a stand, plot, or group of trees, not an individual tree. Canopy bulk density is used to predict whether an active crown fire is possible.

Weather

Weather data (1979-2022) from gridMET was used to analyze potential weather scenarios in which assessing fire behavior and spread. gridMET is a dataset of daily high-spatial resolution (~4-km, 1/24th degree) surface meteorological data covering the contiguous US. Air temperature data at 2m, relative humidity at 2m, and wind speed and direction at 10 m were all downloaded and used.

After computing the weather percentiles of the gridMET variables, data was interpolated using IDW algorithms (Inverse Distance Weighting) at 20-meter pixel resolution.

Dead fuel moisture content was estimated using the model of Rothermel and Rinehart (1983). Both temperature and air relative humidity at 2m from gridMET was used to define the fuel moisture model. The model also considered elevation and aspect to take into account the accumulated solar radiation at 14h (local time). 1% and 2% were added to the 1h-dead fuel moisture content to estimate 10h and 100h dead fuel moisture content, respectively.

For the first time in CO-WRA risk assessments, both herbaceous and woody live fuel moisture content was modelled using Technosylva's proprietary models based on optical imagery, drought indices and phenology. The models were trained with the WFAS National live fuel moisture content. Foliar moisture content in the canopies was considered as a constant value (80%) across the entire state.

Wind speed at 10 m was estimated at 20 ft applying a wind adjustment factor to use 20-ft wind speed in the fire spread and behavior equations. Afterward, wind speed percentiles were computed to use these data in the FB analysis at 20-meter pixel resolution. Wind direction for Colorado was analyzed for a 40-year period (1979-2022) considering the calculated wind speed percentiles from gridMET data. Predominant wind direction is from SW to NE, especially when wind speed is high or very high.

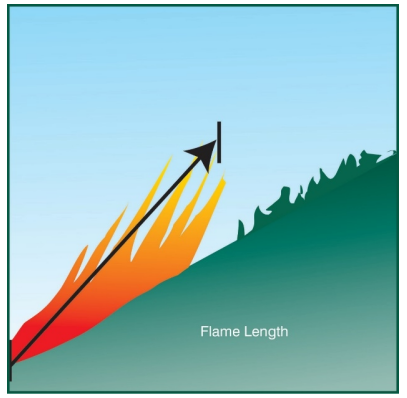
Characteristic Flame Length

The typical or representative flame length of a potential fire based on a weighted average of four percentile weather categories.

Flame Length is defined as the distance between the flame tip and the midpoint of the flame depth at the base of the flame, which is generally the ground surface. It is an indicator of fire intensity and is often used to estimate how much heat the fire is generating.

Flame length is typically measured in feet. Flame length is the measure of fire intensity used to generate the Fire Effects outputs for the CO-WRA and it is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each 20-meter grid cell in Colorado.

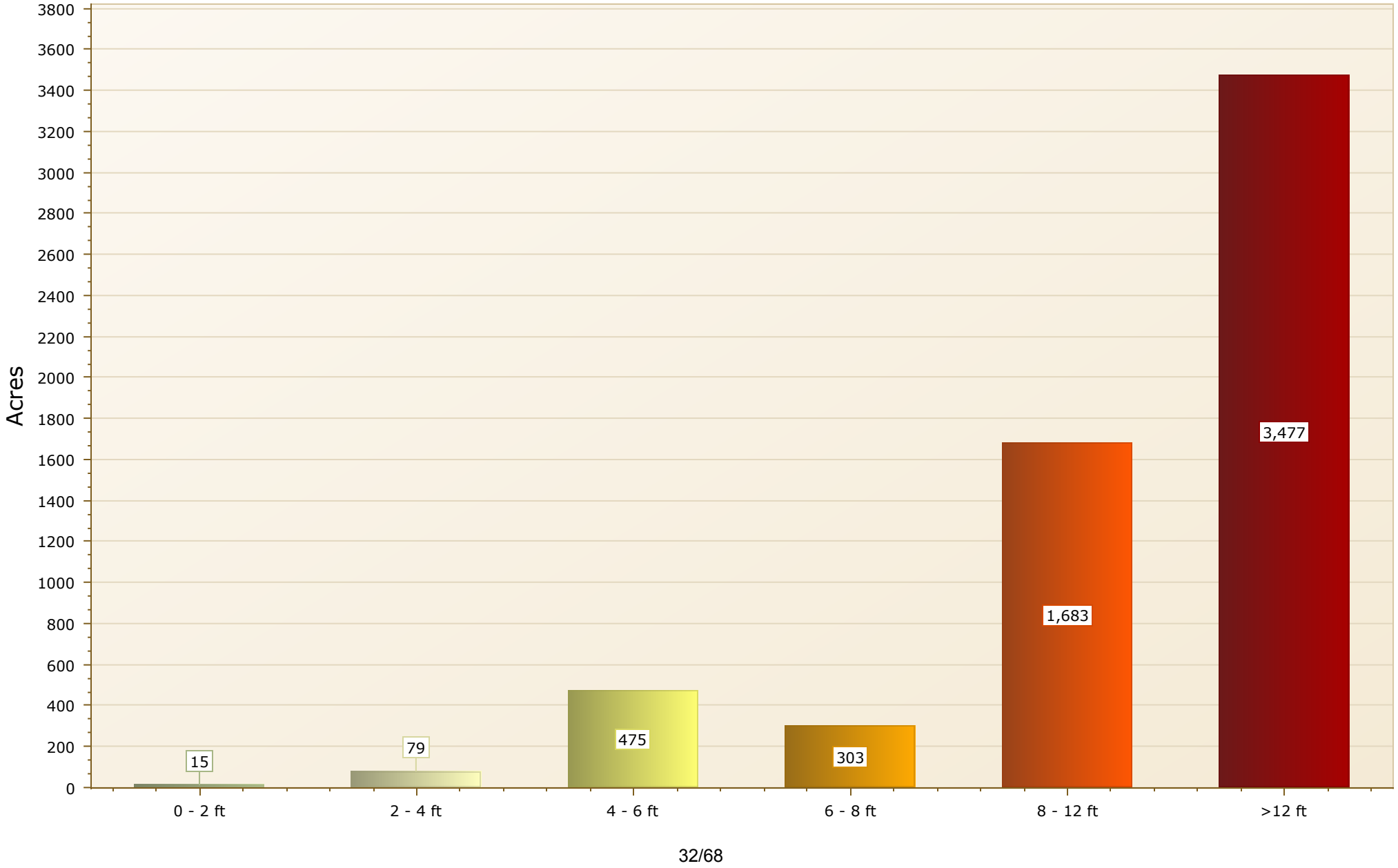
The Characteristic Flame Length represents the weighted average for all four weather percentiles. While not discussed in this report, the individual percentile weather Flame Length outputs are available in the CO-WRA data.

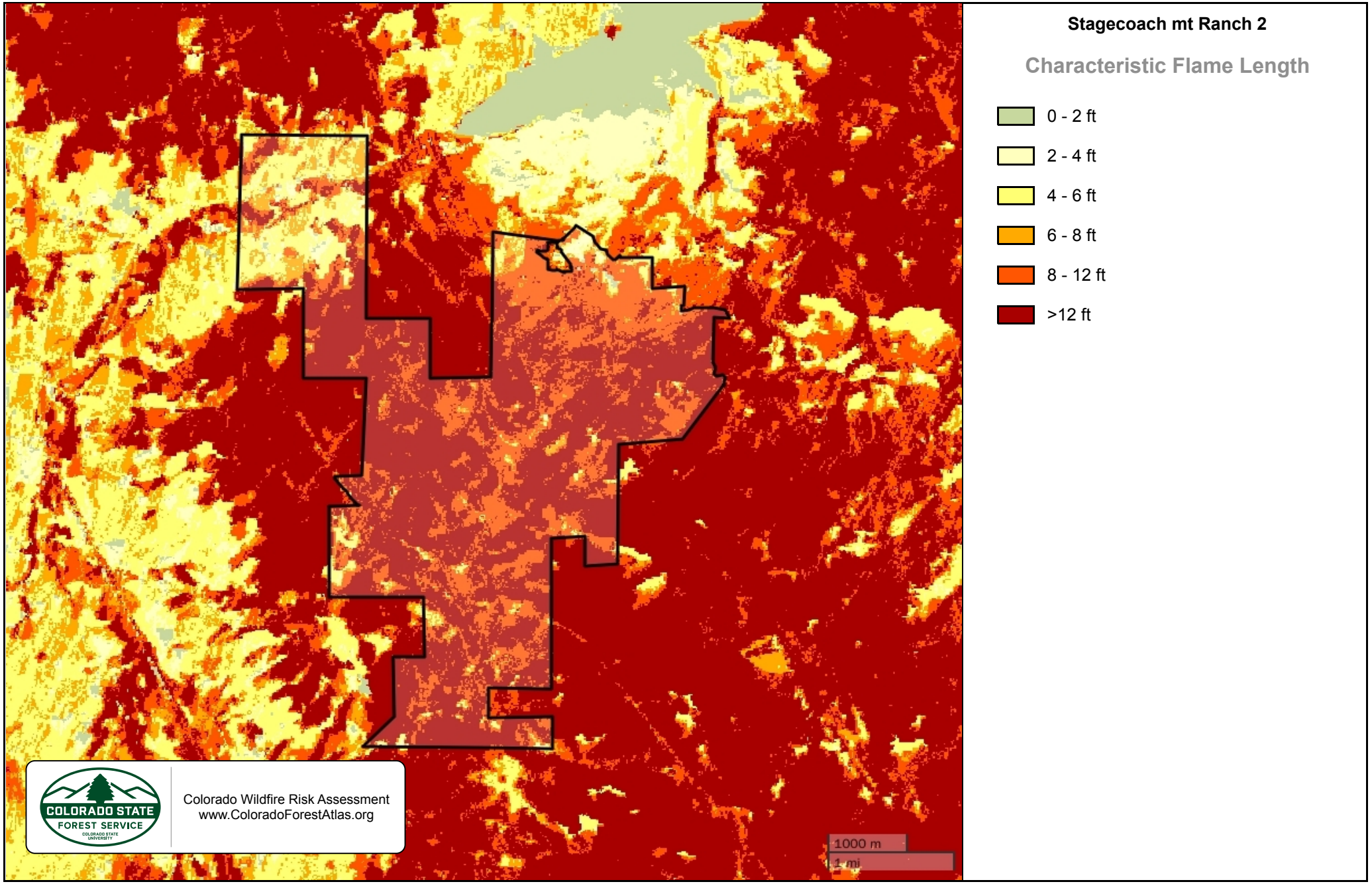


Characteristic Flame Length	Acres	Percent
0 - 2 ft	15	0.2%
2 - 4 ft	79	1.3%
4 - 6 ft	475	7.7%
6 - 8 ft	303	4.9%
8 - 12 ft	1,683	27.4%
>12 ft	3,477	56.6%
Total	**6,033**	**98%**

Characteristic Flame Length

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Characteristic Flame Length
0 - 2 ft
2 - 4 ft
4 - 6 ft
6 - 8 ft
8 - 12 ft
>12 ft
COLORADO STATE FOREST SERVICE
Colorado Wildfire Risk Assessment
www.ColoradoForestAtlas.org
1000 m
1 mi

Fire Intensity Scale

Description

Quantifies the potential fire intensity by orders of magnitude.
Fire Intensity Scale (FIS) specifically identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist. Similar to the Richter scale for earthquakes, FIS provides a standard scale to measure potential wildfire intensity. FIS consist of five (5) classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities.

1. Class 1, Lowest Intensity:
Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.

2. Class 2, Low:
Small flames, usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.

3. Class 3, Moderate:
Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.

4. Class 4, High:
Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.

5. Class 5, Highest Intensity:
Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

Burn Probability and Fire Intensity Scale are designed to complement each other. Unlike Wildfire Threat, the Fire Intensity Scale does not incorporate historical occurrence information. It only evaluates the potential fire behavior for an area, regardless if any fires have occurred there in the past. This additional information allows mitigation planners to quickly identify areas where dangerous fire behavior potential exists in relationship to nearby homes or other valued assets.

Since all areas in Colorado have fire intensity scale calculated consistently, it allows for comparison and ordination of areas across the entire state. For example, a high fire intensity area in Eastern Colorado is equivalent to a high fire intensity area in Western Colorado.

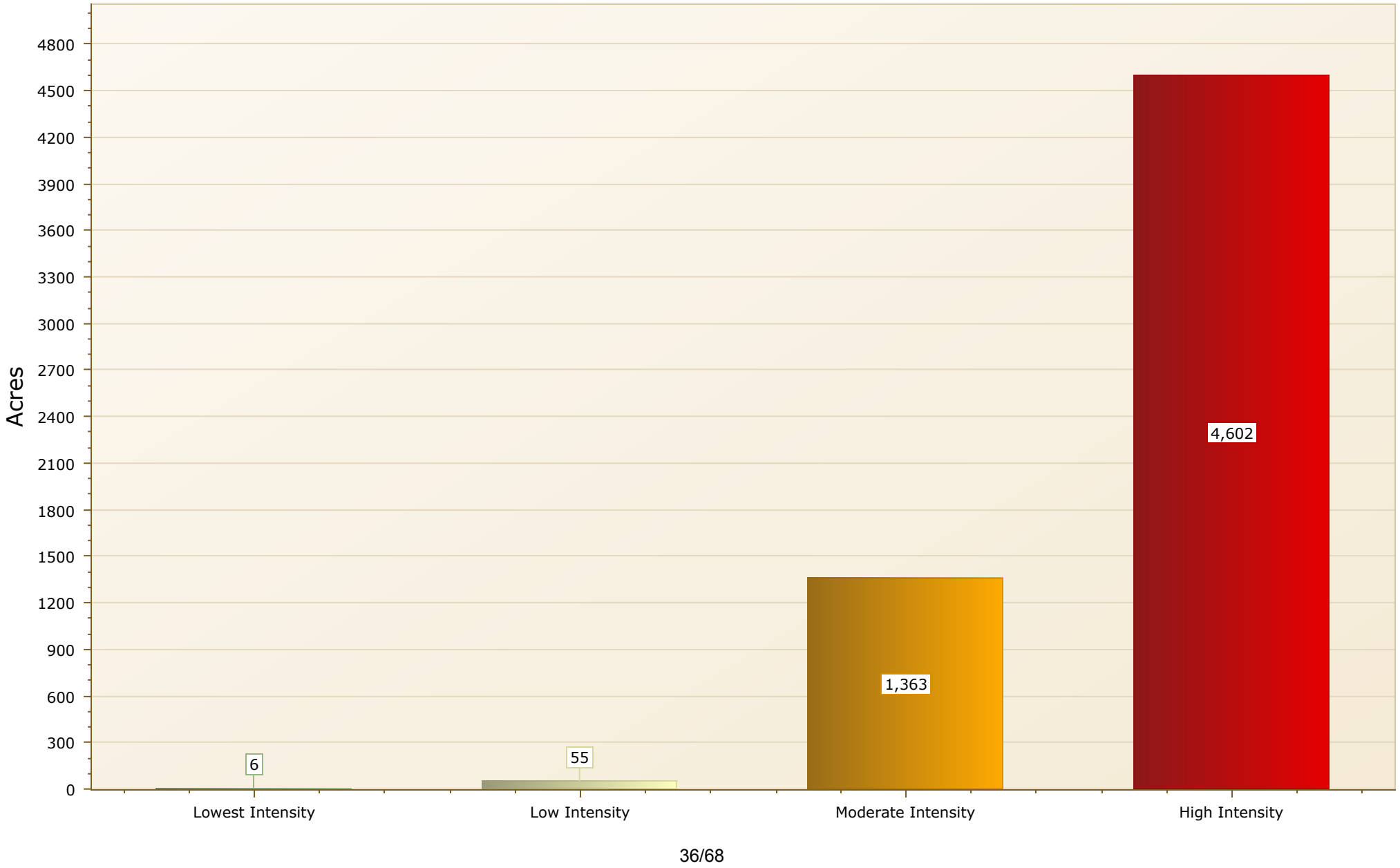
Fire intensity scale is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography – and the spread itself (back, flank or head fire influences fire behavior for a given pixel for a specific fire simulation). Weather is by far the most dynamic variable as it changes frequently. Thus, each pixel may burn many times with different fire spread patterns based on the aforementioned factors. The fire intensity scale maps represent an average fire intensity map.

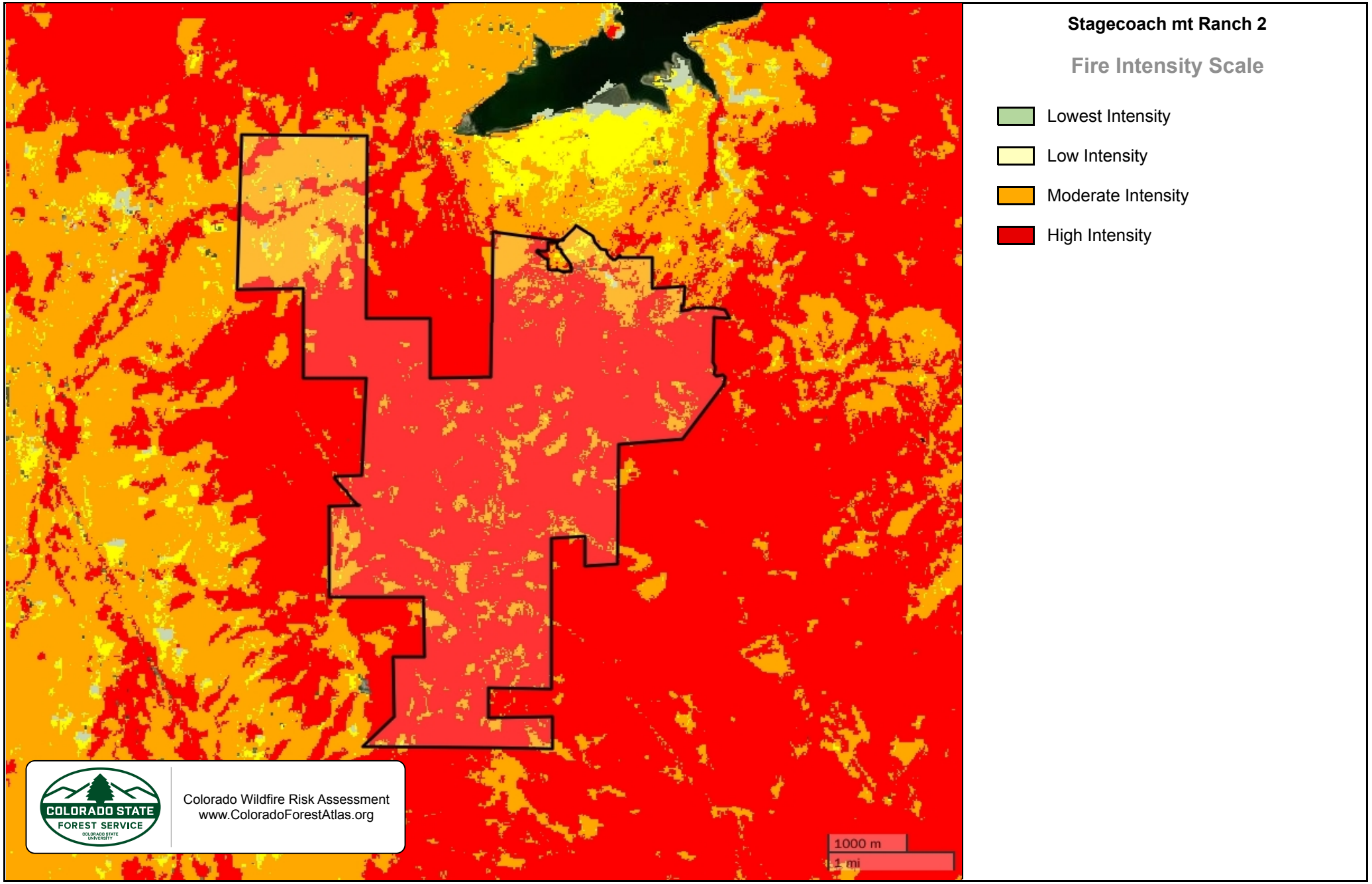
The fire intensity scale map is derived at a 20-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county, or local planning efforts.

FIS Class	Acres	Percent
Lowest Intensity	6	0.1%
Low Intensity	55	0.9%
Moderate Intensity	1,363	22.6%
High Intensity	4,602	76.4%
Total	**6,026**	**100%**

Fire Intensity Scale

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Fire Intensity Scale
Lowest Intensity
Low Intensity
Moderate Intensity
High Intensity
COLORADO STATE
FOREST SERVICE
Colorado Wildfire Risk Assessment
www.ColoradoForestAtlas.org
1000 m
1 mi

Fire Type

Represents the potential fire type under the extreme percentile weather category.

Canopy fires are very dangerous, destructive and difficult to control due to their increased fire intensity. From a planning perspective, it is important to identify where these conditions are likely to occur on the landscape so that special preparedness measure can be taken if necessary. The Fire Type layer shows the footprint of where these areas are most likely to occur. However, it is important to note that canopy fires are not restricted to these areas. Under the right conditions, it can occur in other canopied areas.

There are two primary fire types – surface fire and canopy fire. Canopy fire can be further subdivided into passive canopy fire and active canopy fire. A short description of each of these is provided below.

• Surface Fire - A fire that spreads through surface fuel without consuming any overlying canopy fuel. Surface fuels include grass, timber litter, shrub/brush, slash and other dead or live vegetation within about 6 feet of the ground.

• Passive Canopy Fire – A type of crown fire in which the crowns of individual trees or small groups of trees burn, but solid flaming in the canopy cannot be maintained except for short periods (Scott & Reinhardt, 2001).

• Conditional Crown Fire – A type of crown fire in which an active crown fire is possible but one would not be predicted to initiate. Two outcomes are possible in that situation: surface fire if the fire starts in the stand as a surface fire, or active crown fire if fire enters the stand as an active crown fire.

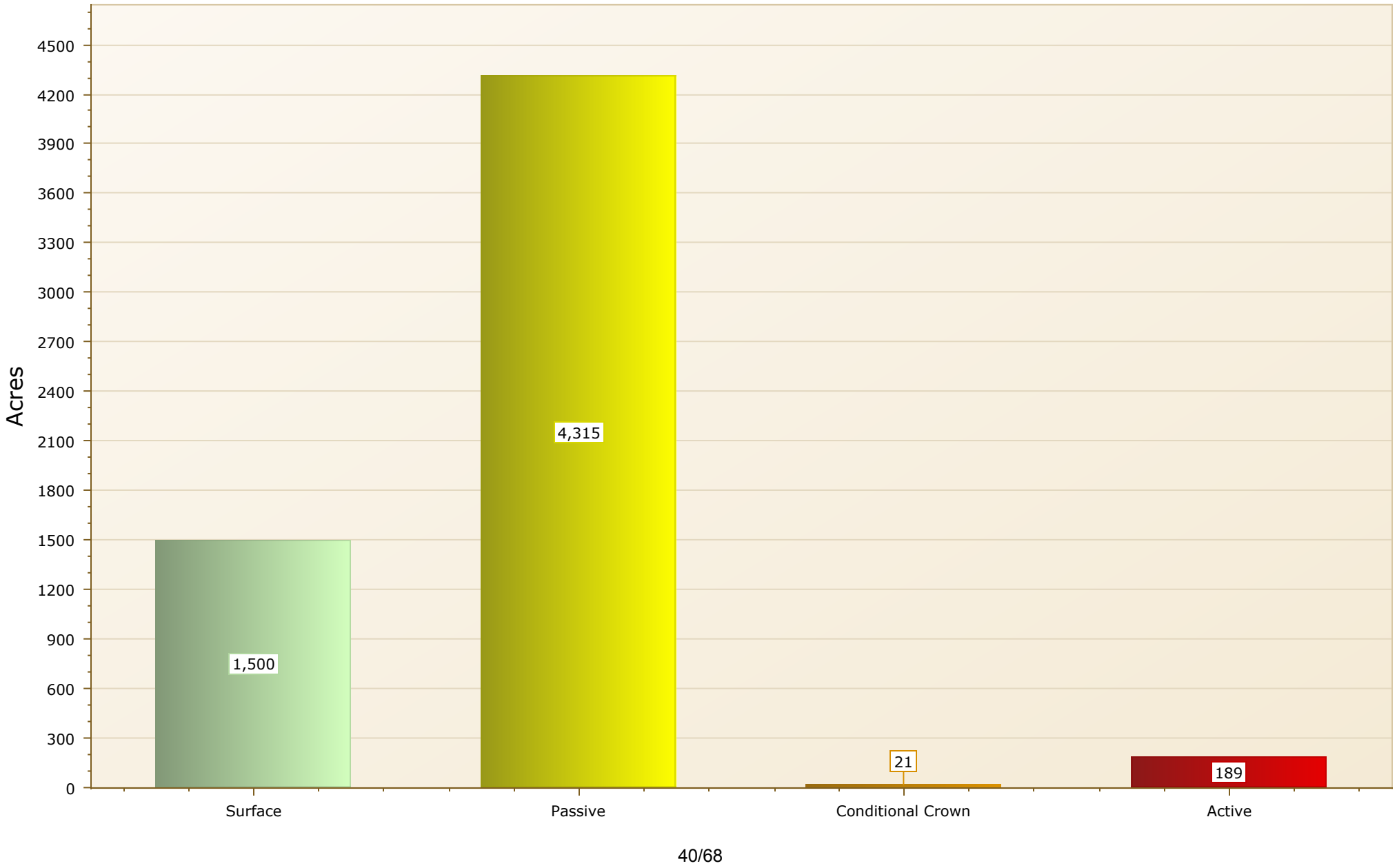
• Active Canopy Fire - A crown fire in which the entire fuel complex (canopy) is involved in flame, but the crowning phase remains dependent on heat released from surface fuel for continued spread (Scott & Reinhardt, 2001).

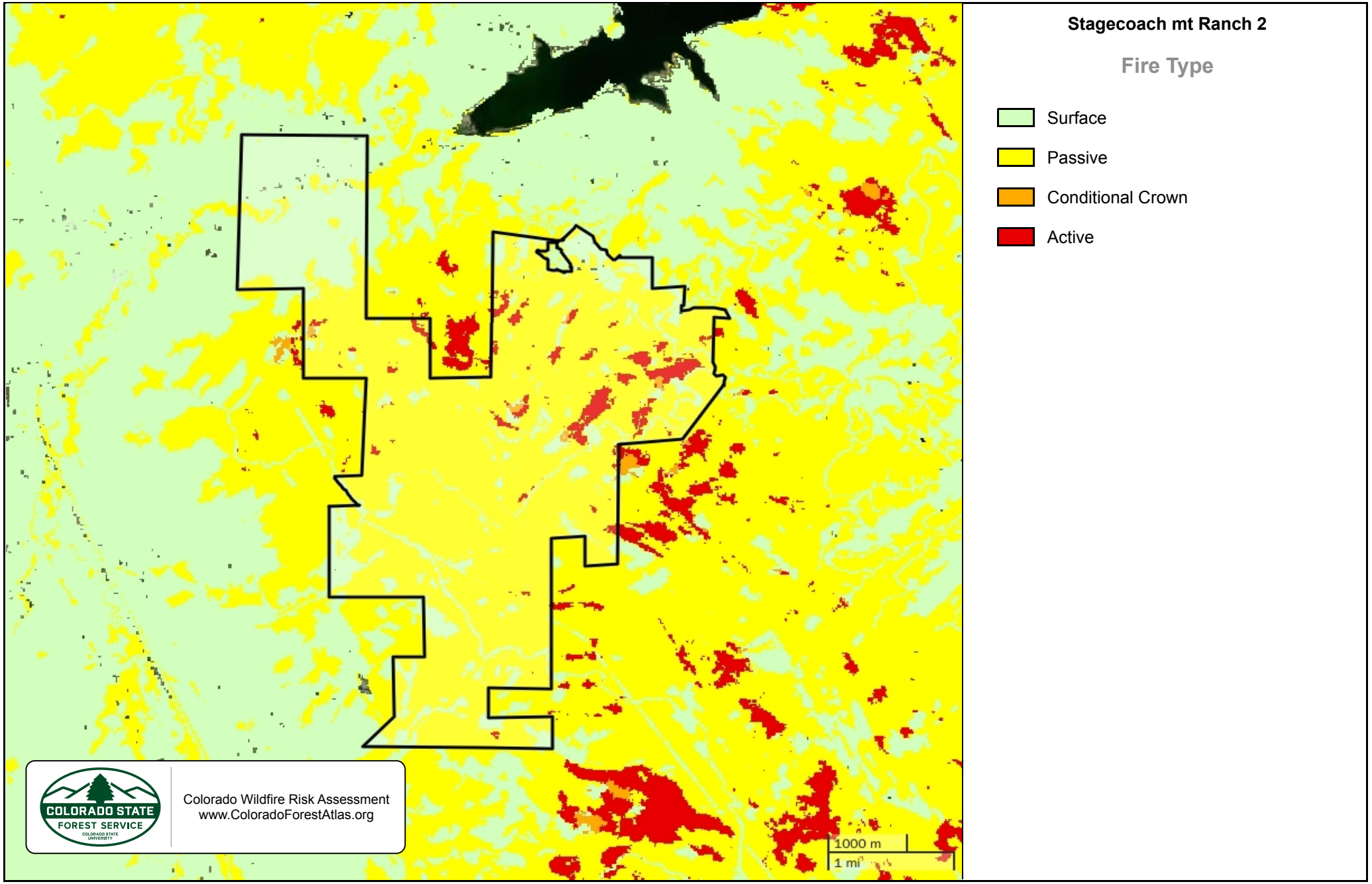
The fire type map is derived at a 20-meter resolution and was estimated based on the extreme weather scenario (percentile 97th). This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local planning efforts.

Fire Type	Acres	Percent
Surface	1,500	24.9%
Passive	4,315	71.6%
Conditional Crown	21	0.3%
Active	189	3.1%
Total	**6,026**	**100%**

Fire Type

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Fire Type
Surface
Passive
Conditional Crown
Active
COLORADO STATE FOREST SERVICE
COLORADO STATE UNIVERSITY
Colorado Wildfire Risk Assessment
www.ColoradoForestAtlas.org
1000 m
1 mi

Rate of Spread

The typical or representative rate of spread of a potential fire based on a weighted average of four percentile weather categories.

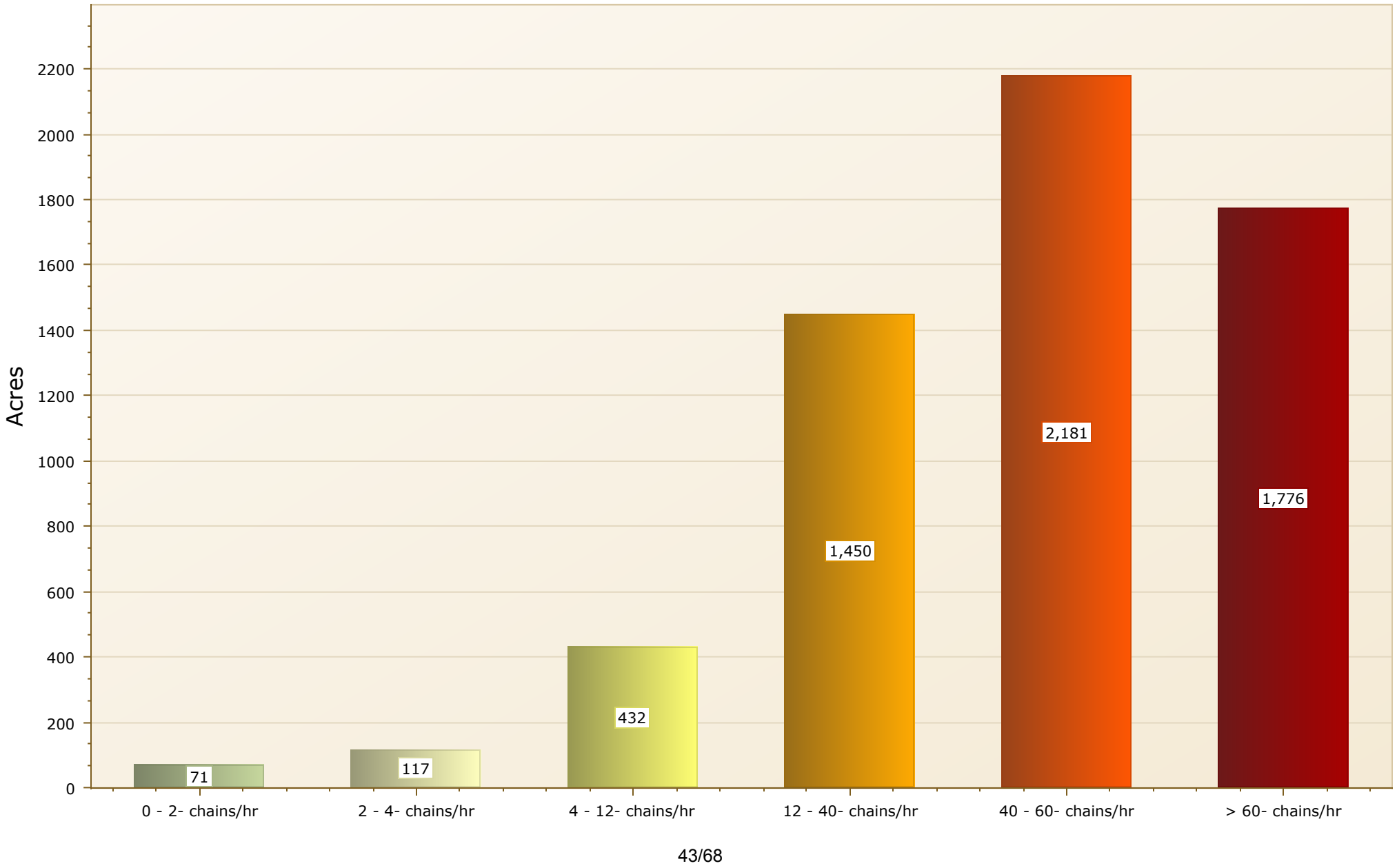
Rate of spread is the speed with which a fire moves in a horizontal direction across the landscape, usually expressed in chains per hour (ch/hr) or feet per minute (ft/min). For purposes of the CO-WRA, this measurement represents the maximum rate of spread of the fire front.

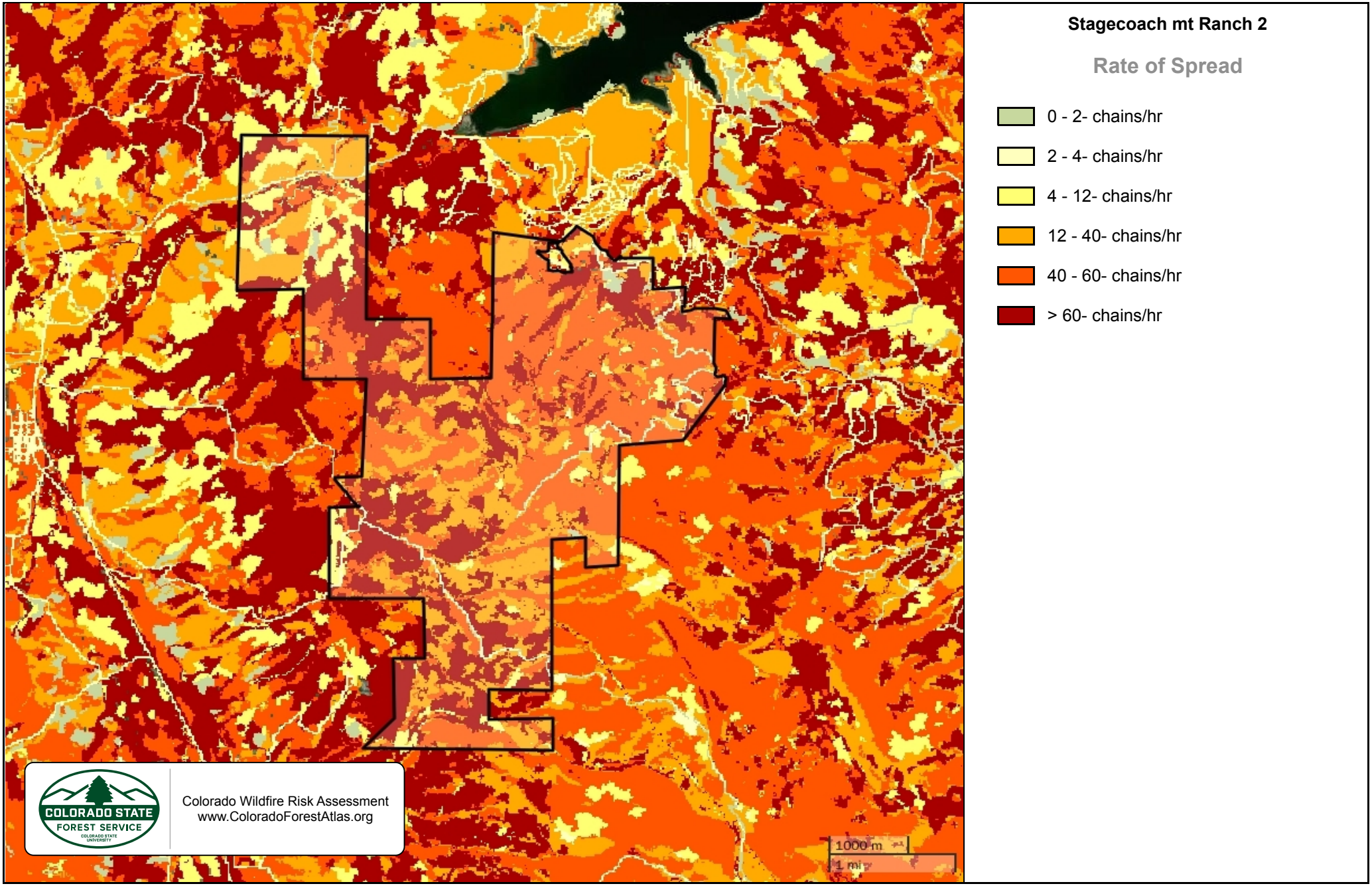
Rate of spread is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for a 20-meter grid cell in Colorado.

Rate of Spread	Acres	Percent
0 - 2- chains/hr	71	1.2%
2 - 4- chains/hr	117	1.9%
4 - 12- chains/hr	432	7.2%
12 - 40- chains/hr	1,450	24.1%
40 - 60- chains/hr	2,181	36.2%
> 60- chains/hr	1,776	29.5%
Total	**6,026**	**100%**

Rate of Spread

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Rate of Spread
0 - 2- chains/hr
2 - 4- chains/hr
4 - 12- chains/hr
12 - 40- chains/hr
40 - 60- chains/hr
> 60- chains/hr
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1000 m
1 mi

Surface Fuels

Fire behavior fuel models that contain the parameters required to calculate fire behavior outputs.

Surface fuels, or fire behavior fuel models as they are technically referred to, contain the parameters needed by the Rothermel (1972) surface fire spread model to compute surface fire behavior characteristics, e.g. rate of spread, flame length, fireline intensity, and other fire behavior metrics. As the name might suggest, surface fuels account only for surface fire potential. Canopy fire potential is computed through a separate but linked process. The CO-WRA accounts for both surface and canopy fire potential in the fire behavior outputs.

An up-to-date surface fuel dataset at 20-meter (m) resolution was developed for this project, based on Scott and Burgan (2005) fuel models, enhanced with custom fuels created by Technosylva. The custom fuels distinguish this assessment from previous ones performed in Colorado as they allow a better characterization of fire behavior across the landscape. Additionally, the urban and road custom fuel models included in the assessment are key for better characterizing the exposure, vulnerability and risk of both buildings and population in the Wildland Urban Interface (WUI). This also allows for better modeling of fire encroachment in urban areas considering the building density, community structure and fuels surrounding the buildings and urban areas.

The following custom fuels were included in order to improve the fire modeling in timber, WUI and agricultural areas:

- Timber: 2 new categories (171 and 191)
- Urban: 7 new categories (911,912,913,914,915,916 and 919)
- Roads: 5 new categories (941,942,943,944 and 949)
- Agriculture: 4 new categories (931,932,938a and 939)
- Water: 3 new categories (981,982 and 989)

Additionally, we also considered canopy fuel data to better simulate crown fire behavior. This includes:

- canopy bulk density (CBD),
- canopy base height (CBH),
- canopy cover (CC) and
- canopy height (CH).

Unmanaged forest with dead amd dowmed trees and branches

Slash on the ground indicates that forest management treatments have occurred in this area

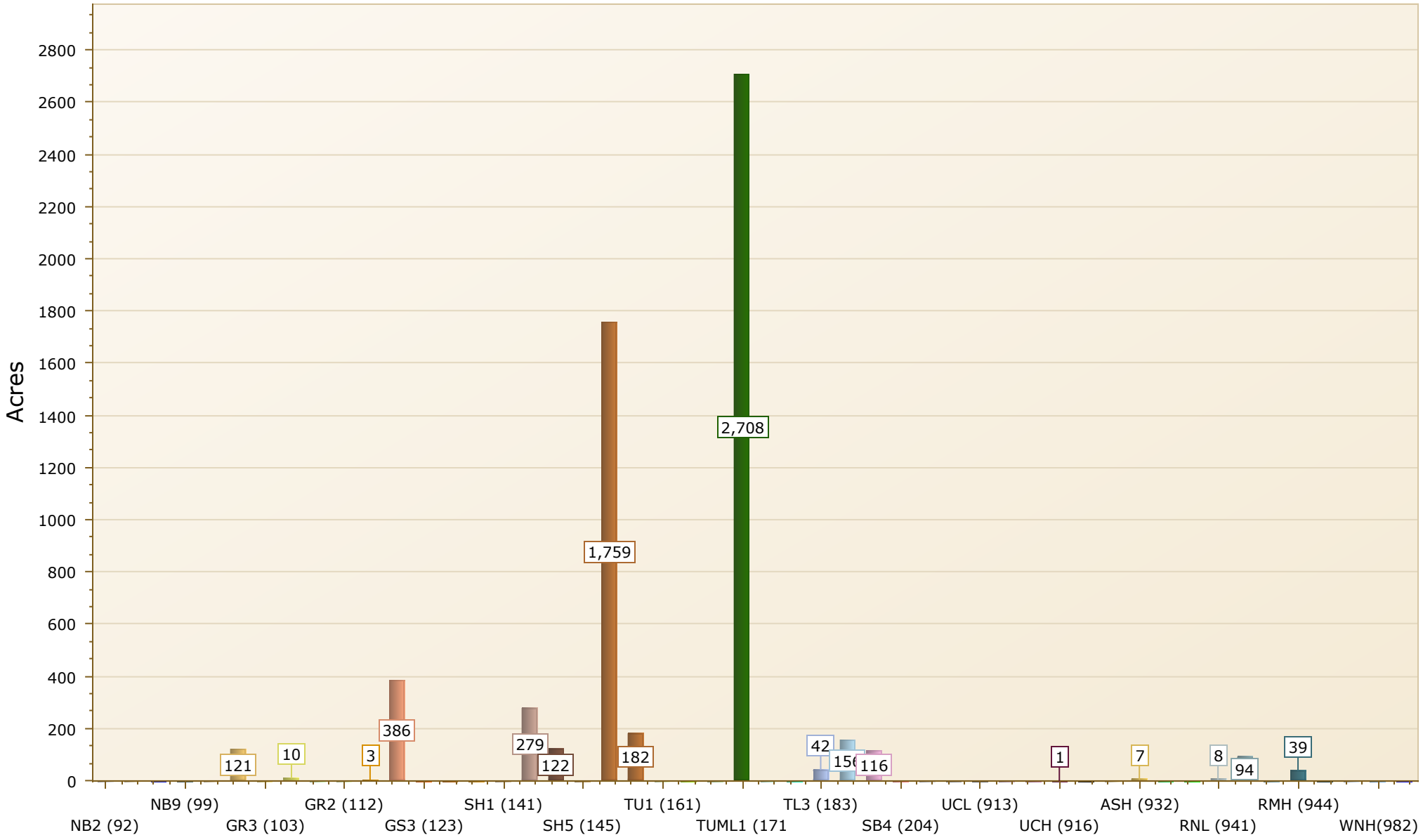
The updated fuel dataset also considered the effects of natural disturbances on vegetation (fires, insect and disease, and harvesting/fuel treatments) that occurred in Colorado from 2013 to 2022. More information about the methods used can be found in the Colorado 2022 Fuels Mapping Final Report.

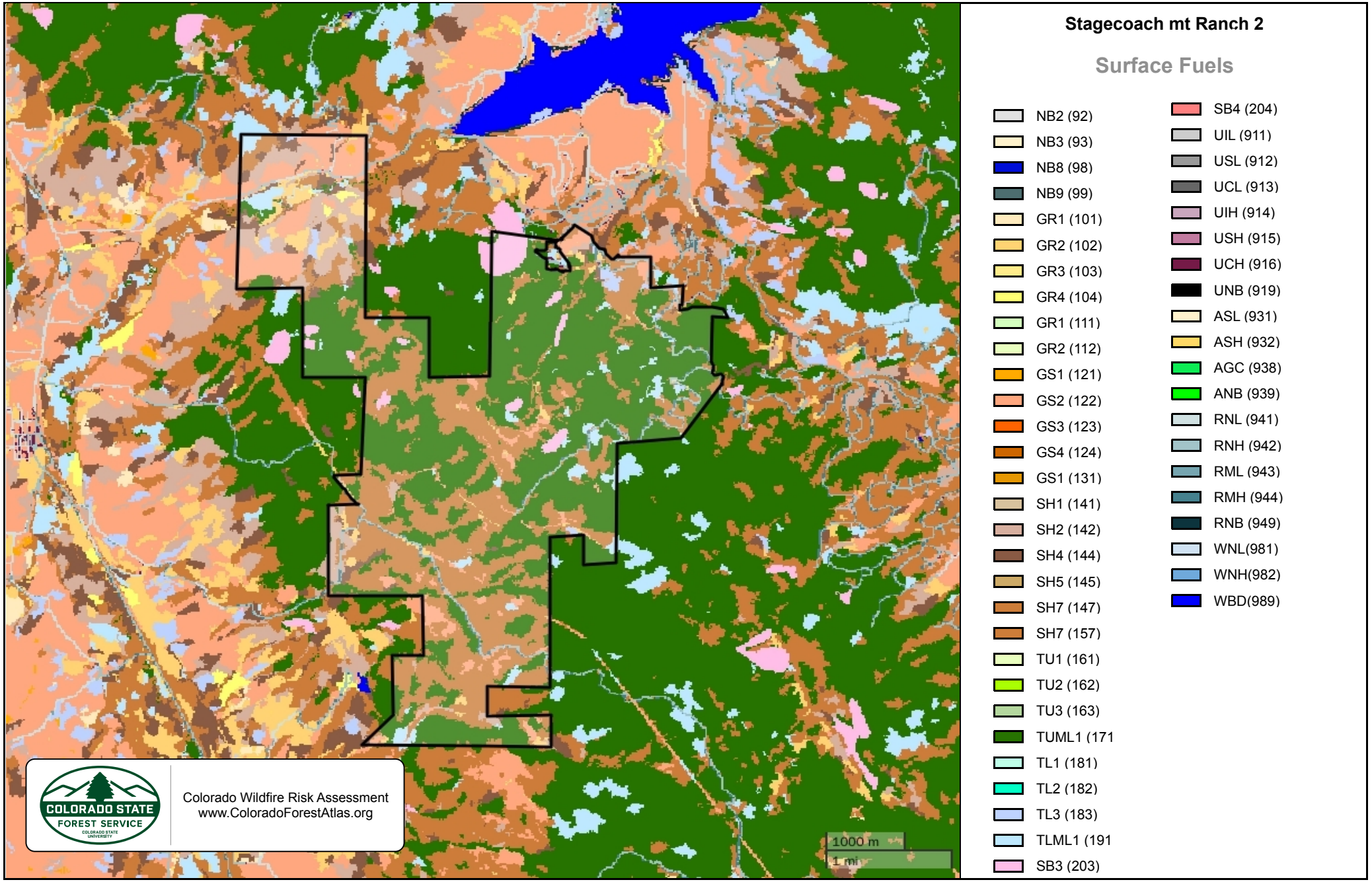
Surface Fuels	Description	Acres	Percent
NB2 (92)	Snow/Ice		0%
NB3 (93)	Agricultural		0%
NB8 (98)	Open Water		0%
NB9 (99)	Bare Ground		0%
GR1 (101)	Short, Sparse Dry Climate Grass		0%
GR2 (102)	Low Load, Dry Climate Grass	121	2%
GR3 (103)	Low Load, Very Coarse, Humid Climate Grass		0%
GR4 (104)	Moderate Load, Dry Climate Grass	10	0.2%
GR1 (111)	Short, Sparse Dry Climate Grass - ALPINE		0%
GR2 (112)	Low Load, Dry Climate Grass - ALPINE		0%
GS1 (121)	Low Load, Dry Climate Grass-Shrub	3	0%
GS2 (122)	Moderate Load, Dry Climate Grass-Shrub	386	6.4%
GS3 (123)	Moderate Load, Humid Climate Grass-Shrub		0%
GS4 (124)	High Load, Humid Climate Grass-Shrub		0%
GS1 (131)	Low Load, Dry Climate Grass-Shrub - ALPINE		0%
SH1 (141)	Low Load Dry Climate Shrub		0%
SH2 (142)	Moderate Load Dry Climate Shrub	279	4.6%
SH4 (144)	Low Load, Humid Climate Timber-Shrub	122	2%
SH5 (145)	High Load, Dry Climate Shrub		0%
SH7 (147)	Very High Load, Dry Climate Shrub	1,759	29.2%
SH7 (157)	Very High Load, Dry Climate Shrub	182	3%
TU1 (161)	Low Load Dry Climate Timber-Grass-Shrub		0%
TU2 (162)	Moderate Load, Humid Climate Timber-Shrub		0%
TU3 (163)	Moderate Load, Humid Climate Timber-Grass-Shrub		0%
TUML1 (171	Timber Understory Dynamic ML (TSYL 2022)	2,708	44.9%
TL1 (181)	Low Load Compact Conifer Litter		0%
TL2 (182)	Low Load Broadleaf Litter		0%
TL3 (183)	Moderate Load Conifer Litter	42	0.7%
TLML1 (191	Timber Litter ML (TSYL 2022)	156	2.6%

Surface Fuels	Description	Acres	Percent
SB3 (203)	High Load Activity Fuel or Moderate Load Blowdown	116	1.9%
SB4 (204)	High Load Blowdown		0%
UIL (911)	Isolated urban surrounded by Low FB fuel		0%
USL (912)	Scattered urban surrounded by Low FB fuel		0%
UCL (913)	Urban core surrounded by Low FB fuel		0%
UIH (914)	Isolated urban surrounded by High FB fuel		0%
USH (915)	Scattered urban surrounded by High FB fuel		0%
UCH (916)	Urban core surrounded by High FB fuel	1	0%
UNB (919)	Unburnable urban areas		0%
ASL (931)	Agricultural Low Load Fuels, with seasonal changes of its Burnable condition		0%
ASH (932)	Agricultural High Load Fuels, with seasonal changes of its Burnable condition	7	0.1%
AGC (938)	Golf courses - Non-Burnable (no encroachment)		0%
ANB (939)	Agricultural Fields, maintained in a Non-Burnable condition		0%
RNL (941)	Minor roads Low FB	8	0.1%
RNH (942)	Minor roads High FB	94	1.6%
RML (943)	Major roads Low FB		0%
RMH (944)	Major roads High FB	39	0.6%
RNB (949)	Roads surrounded by non-burnable fuels		0%
WNL(981)	Minor Water streams surrounded by Low Load Fuel (moderate encroachment)		0%
WNH(982)	Minor Water streams surrounded by High Load Fuel (high encroachment)		0%
WBD(989)	Water Bodies		0%
Total		**6,033**	**100%**

Surface Fuels

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Surface Fuels
NB2 (92)
NB3 (93)
NB8 (98)
NB9 (99)
GR1 (101)
GR2 (102)
GR3 (103)
GR4 (104)
GR1 (111)
GR2 (112)
GS1 (121)
GS2 (122)
GS3 (123)
GS4 (124)
GS1 (131)
SH1 (141)
SH2 (142)
SH4 (144)
SH5 (145)
SH7 (147)
SH7 (157)
TU1 (161)
TU2 (162)
TU3 (163)
TUML1 (171
TL1 (181)
TL2 (182)
TL3 (183)
TLML1 (191
SB3 (203)
SB4 (204)
UIL (911)
USL (912)
UCL (913)
UIH (914)
USH (915)
UCH (916)
UNB (919)
ASL (931)
ASH (932)
AGC (938)
ANB (939)
RNL (941)
RNH (942)
RML (943)
RMH (944)
RNB (949)
WNL(981)
WNH(982)
WBD(989)
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1000 m
1 mi

Vegetation

The Vegetation map describes the general vegetation and landcover types across the state of Colorado.

In the CO-WRA, the Vegetation dataset is used to support the development of the Surface Fuels, Canopy Cover, Canopy Stand Height, Canopy Base Height, and Canopy Bulk Density datasets.
The 2020 LANDFIRE program data product (Existing Vegetation Type) was used to compile the Vegetation data for the CO-WRA. This reflects data current to 2020. The LANDFIRE EVT data were classified to reflect general vegetation cover types for representation with CFA.

Oak shrublands are commonly found añlong dry foothills and lower mountain slopes, and are often situates above Piñyon-juniper.

Piñyon-juniper woodlands are common in southern and southwestern Colorado

Douglas-fir understory in a ponderosa pine forest

Grasslands occur both on Colorado's Eastern Plains and on the Western Slope.

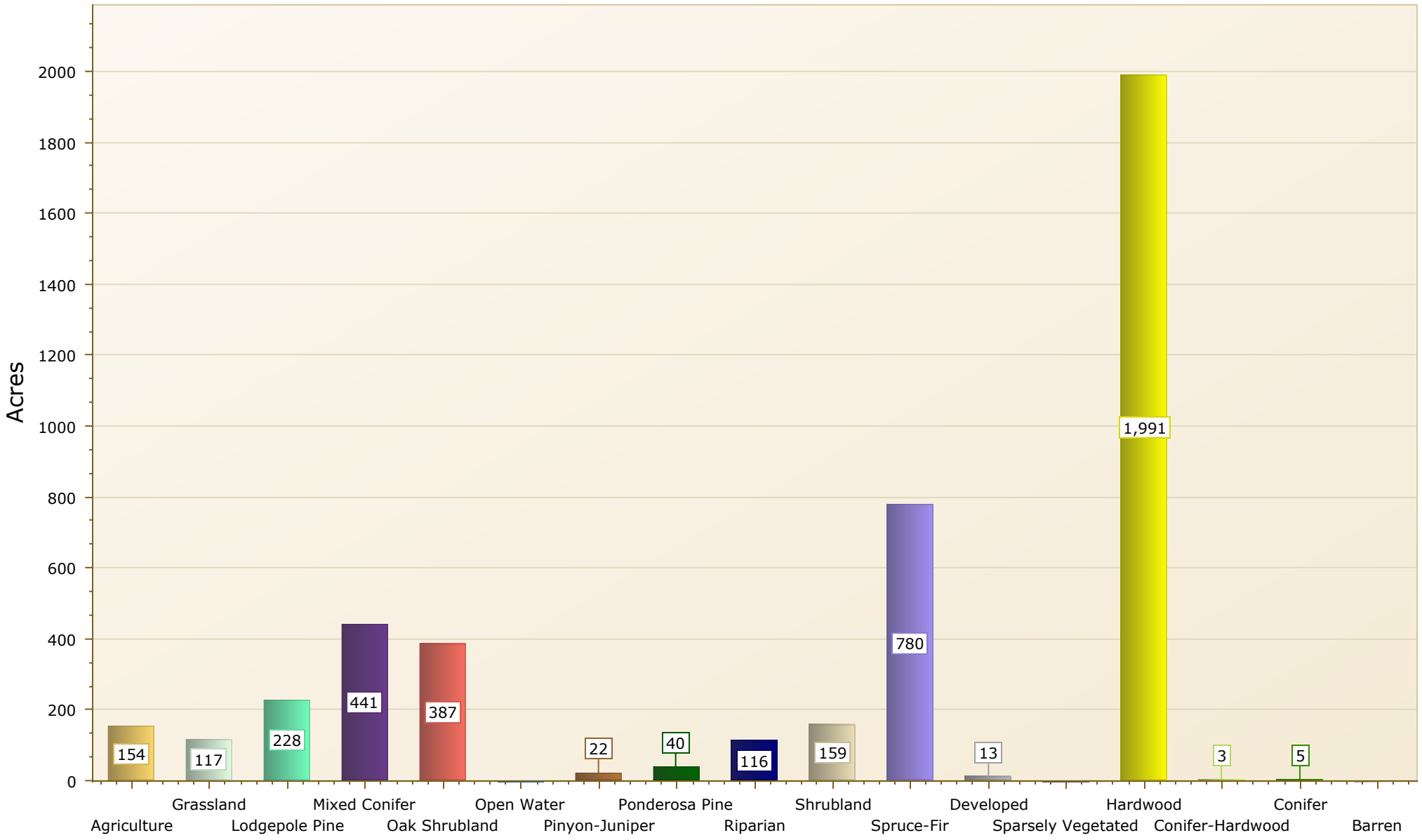
Wildland fire threat increases in lodgepole pine as the dense forest grow old

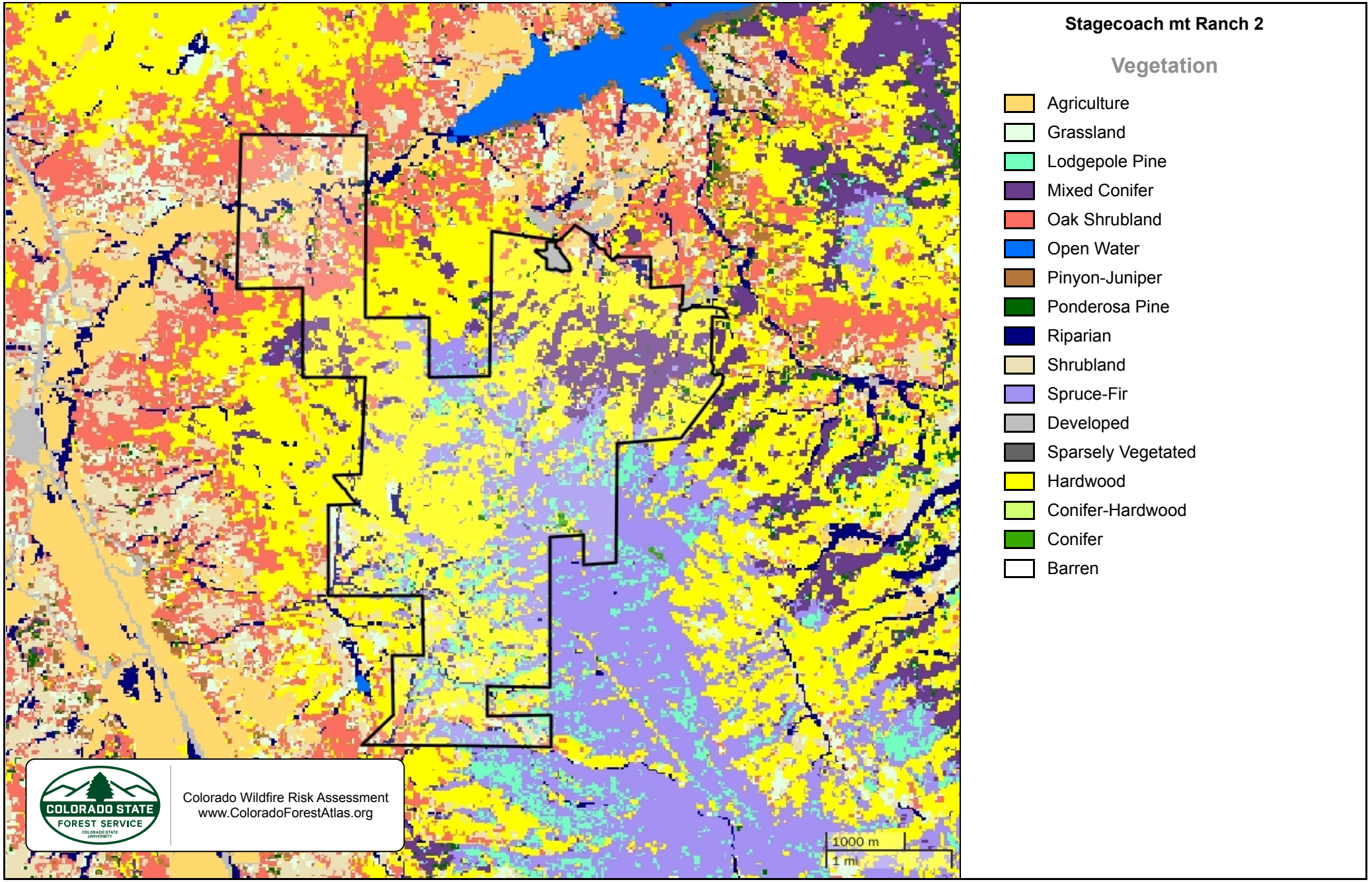
Overly dense ponderosa pine, a dominant species of the montane zone

Vegetation Class	Acres	Percent
Agriculture	154	3.5%
Grassland	117	2.6%
Lodgepole Pine	228	5.1%
Mixed Conifer	441	9.9%
Oak Shrubland	387	8.7%
Open Water		0%
Pinyon-Juniper	22	0.5%
Ponderosa Pine	40	0.9%
Riparian	116	2.6%
Shrubland	159	3.6%
Spruce-Fir	780	17.5%
Developed	13	0.3%
Sparsely Vegetated		0%
Hardwood	1,991	44.7%
Conifer-Hardwood	3	0.1%
Conifer	5	0.1%
Barren		0%
Total	**4,457**	**100%**

Vegetation

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Vegetation
Agriculture
Grassland
Lodgepole Pine
Mixed Conifer
Oak Shrubland
Open Water
Pinyon-Juniper
Ponderosa Pine
Riparian
Shrubland
Spruce-Fir
Developed
Sparsely Vegetated
Hardwood
Conifer-Hardwood
Conifer
Barren
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Watershed Protection Risk

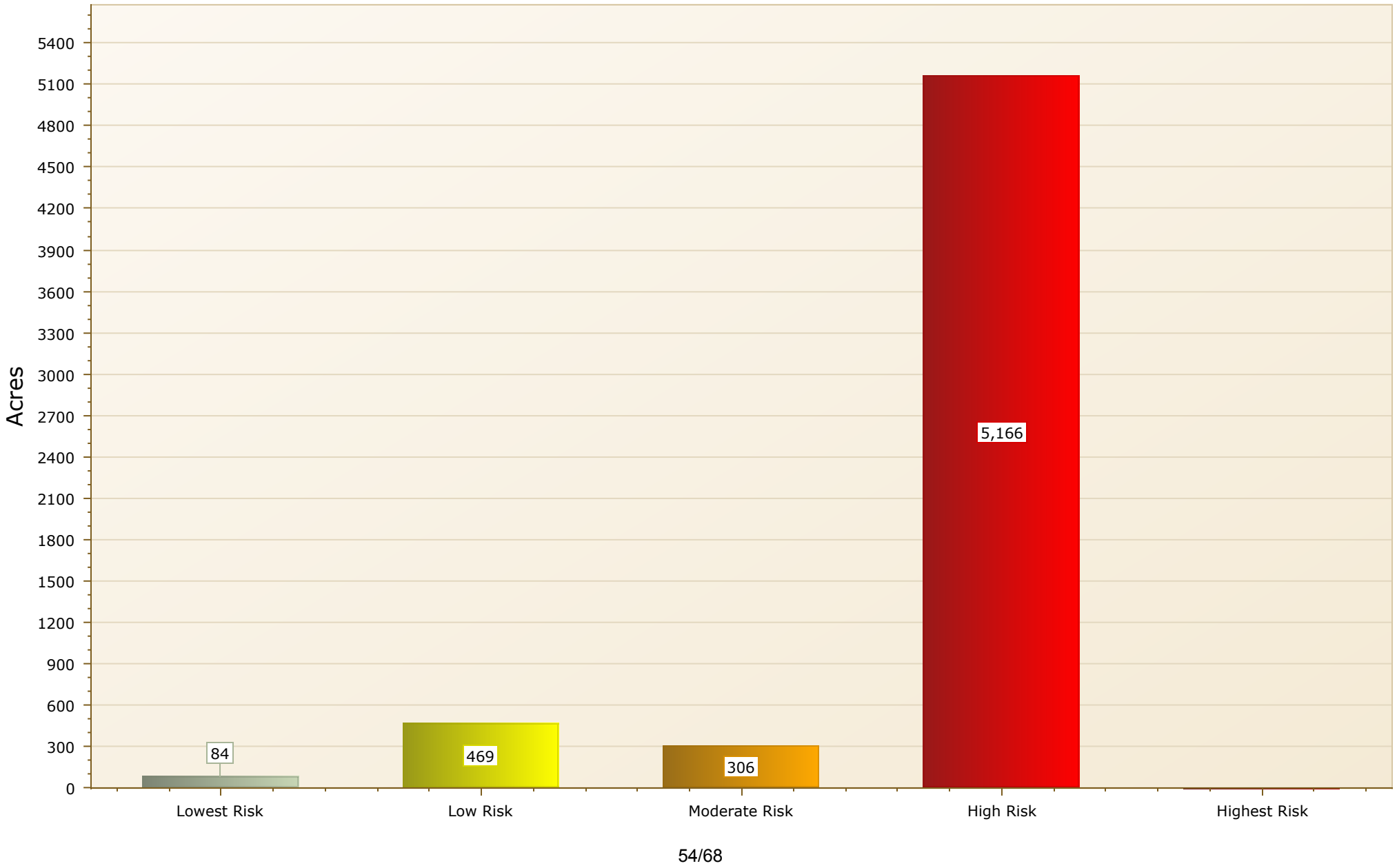
A measure of the risk to Watershed Protection Areas based on the potential negative impacts from wildfire.

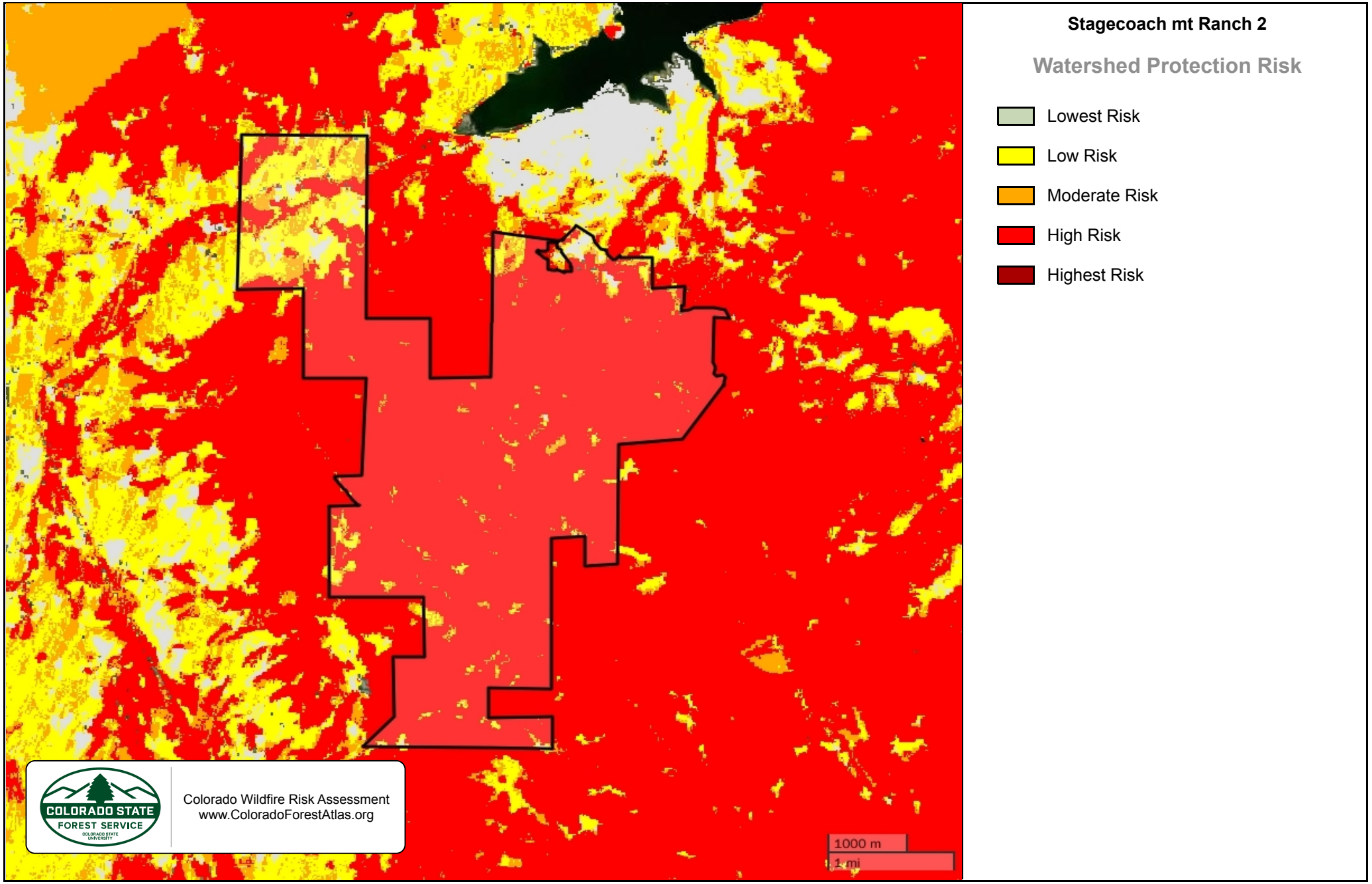
In areas that experience low-severity burns, fire events can serve to eliminate competition, rejuvenate growth and improve watershed conditions. But in landscapes subjected to high, or even moderate-burn severity, the post-fire threats to public safety and natural resources can be extreme.
High-severity wildfires remove virtually all forest vegetation – from trees, shrubs and grasses down to discarded needles, decomposed roots and other elements of ground cover or duff that protect forest soils. A severe wildfire also can cause certain types of soil to become hydrophobic by forming a waxy, water-repellent layer that keeps water from penetrating the soil, dramatically amplifying the rate of runoff.
The loss of critical surface vegetation leaves forested slopes extremely vulnerable to large-scale soil erosion and flooding during subsequent storm events. In turn, these threats can impact the health, safety and integrity of communities and natural resources downstream. The likelihood that such a post-fire event will occur in Colorado is increased by the prevalence of highly erodible soils in several parts of the state, and weather patterns that frequently bring heavy rains on the heels of fire season.
In the aftermath of the 2002 fire season, the Colorado Department of Health estimated that 26 municipal water storage facilities were shut down due to fire and post-fire impacts. The potential for severe soil erosion is a consequence of wildfire because as a fire burns, it destroys plant material and the litter layer. Shrubs, forbs, grasses, trees and the litter layer disperse water during severe rainstorms. Plant roots stabilize the soil, and stems and leaves slow the water to give it time to percolate into the soil profile. Fire can destroy this soil protection.
The risk index has been calculated by combining the Watershed Protection data with a measure of fire intensity using a Response Function approach. Those areas with the highest negative impact (-9) represent areas with high potential fire intensity and high importance for ecosystem services. Those areas with the lowest negative impact (-1) represent those areas with low potential fire intensity and a low importance for ecosystem services. The response function outputs were combined into 5 qualitative classes.

Watershed Protection Risk	Acres	Percent
Lowest Risk	84	1.4%
Low Risk	469	7.8%
Moderate Risk	306	5.1%
High Risk	5,166	85.7%
Highest Risk		0%
Total	**6,026**	**100%**

Watershed Protection Risk

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Watershed Protection Risk
Lowest Risk
Low Risk
Moderate Risk
High Risk
Highest Risk
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Riparian Assets Risk

A measure of the risk to riparian areas based on the potential negative impacts from wildfire.

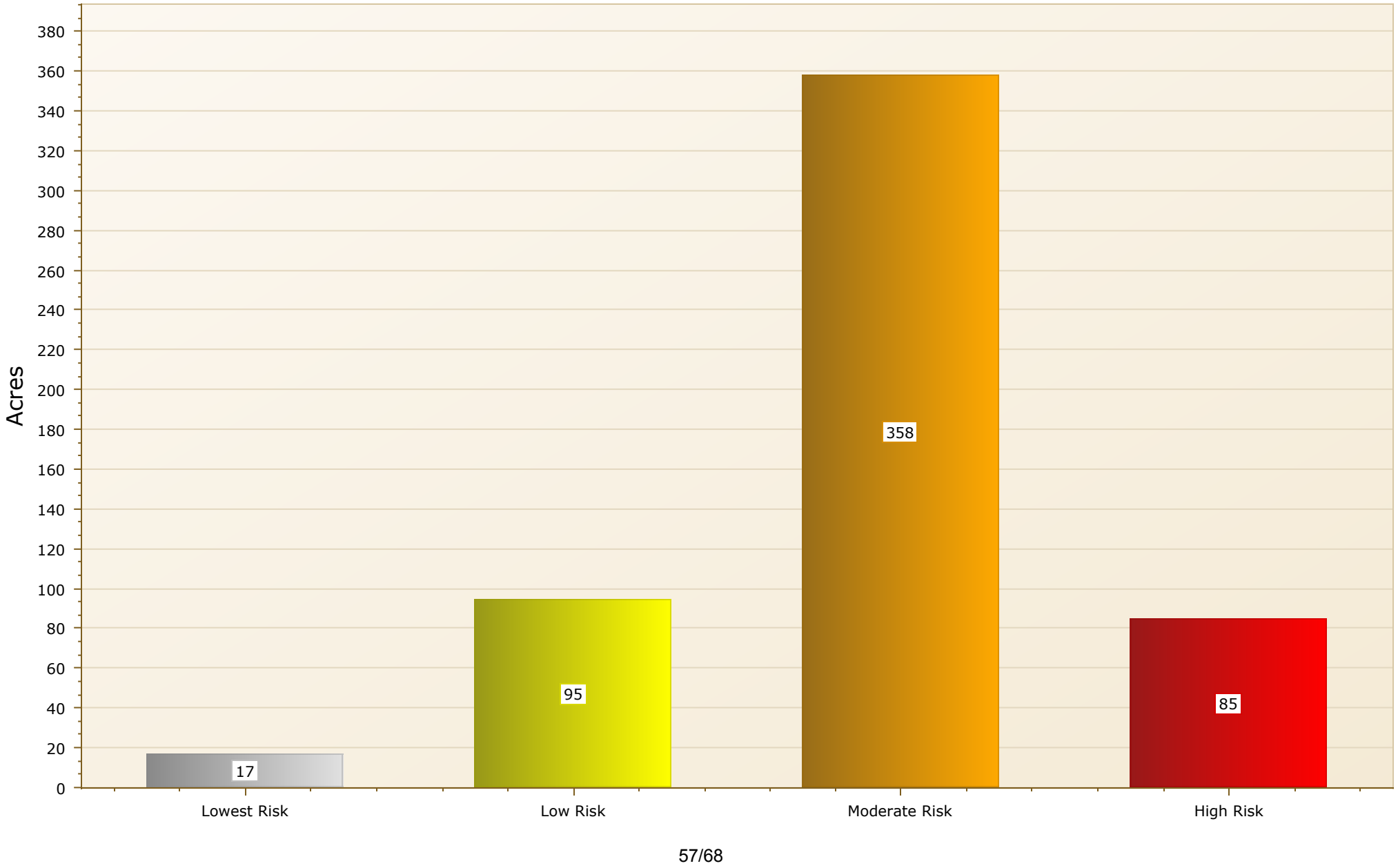
The risk index has been calculated by combining the Riparian Assets data with a measure of fire intensity using a Response Function approach. Those areas with the highest negative impact (-9) represent areas with high potential fire intensity and high importance for ecosystem services. Those areas with the lowest negative impact (-1) represent those areas with low potential fire intensity and a low importance for ecosystem services. The response function outputs were combined into 5 qualitative classes.

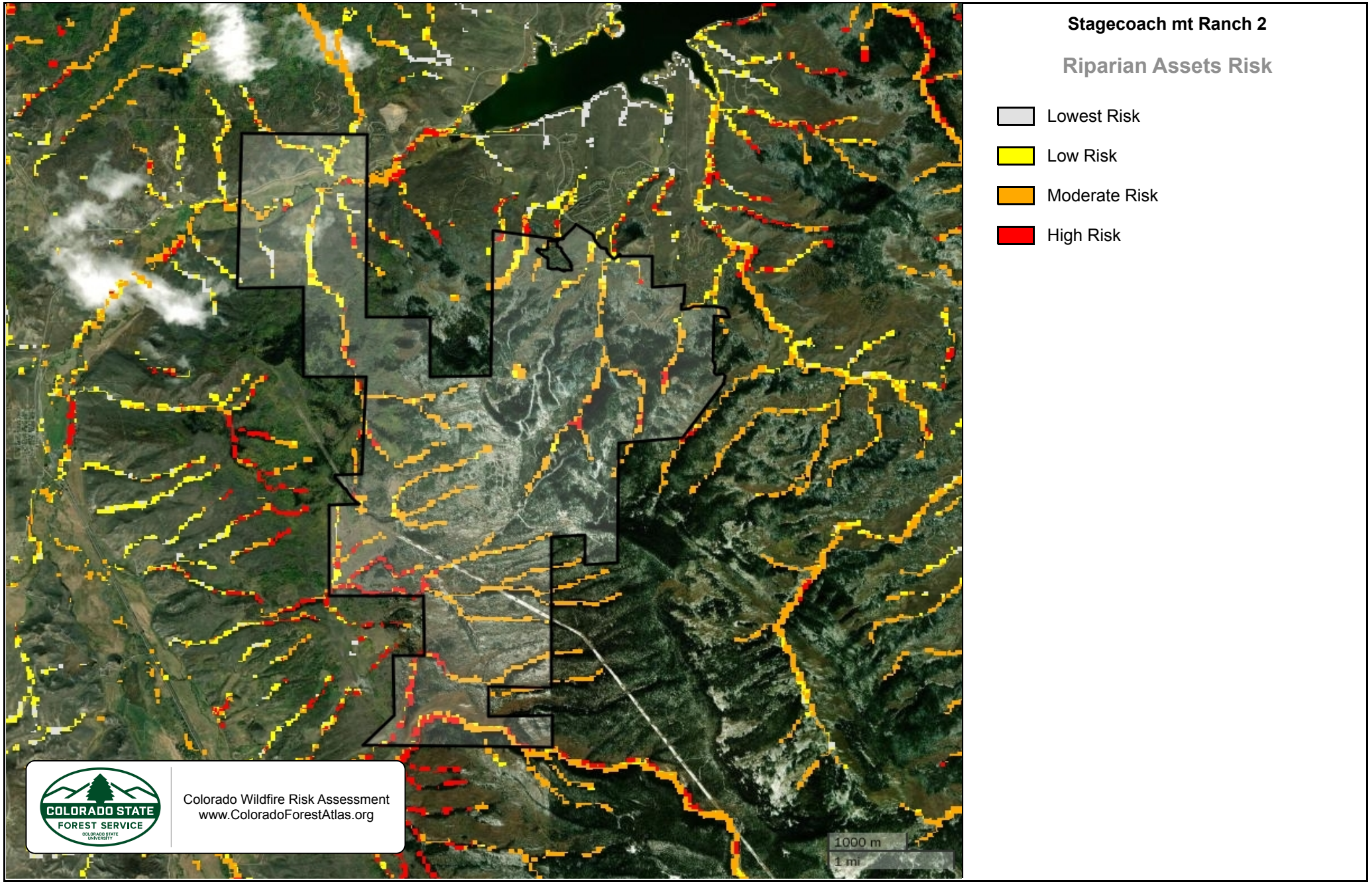
This risk output is intended to supplement the Watershed Protection Risk Index by identifying wildfire risk within the more detailed riparian areas.

Riparian Assets Risk		Acres	Percent
	Lowest Risk	17	3.1%
	Low Risk	95	17.1%
	Moderate Risk	358	64.5%
	High Risk	85	15.3%
Total		**555**	**100%**

Riparian Assets Risk

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Riparian Assets Risk
Lowest Risk
Low Risk
Moderate Risk
High Risk
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1 mi

Forest Assets Risk

A measure of the risk to forested areas based on the potential negative impacts from wildfire.
This layer identifies those forested areas with the greatest potential for adverse effects from wildfire.This layer identifies those forested areas with the greatest potential for adverse effects from wildfire.

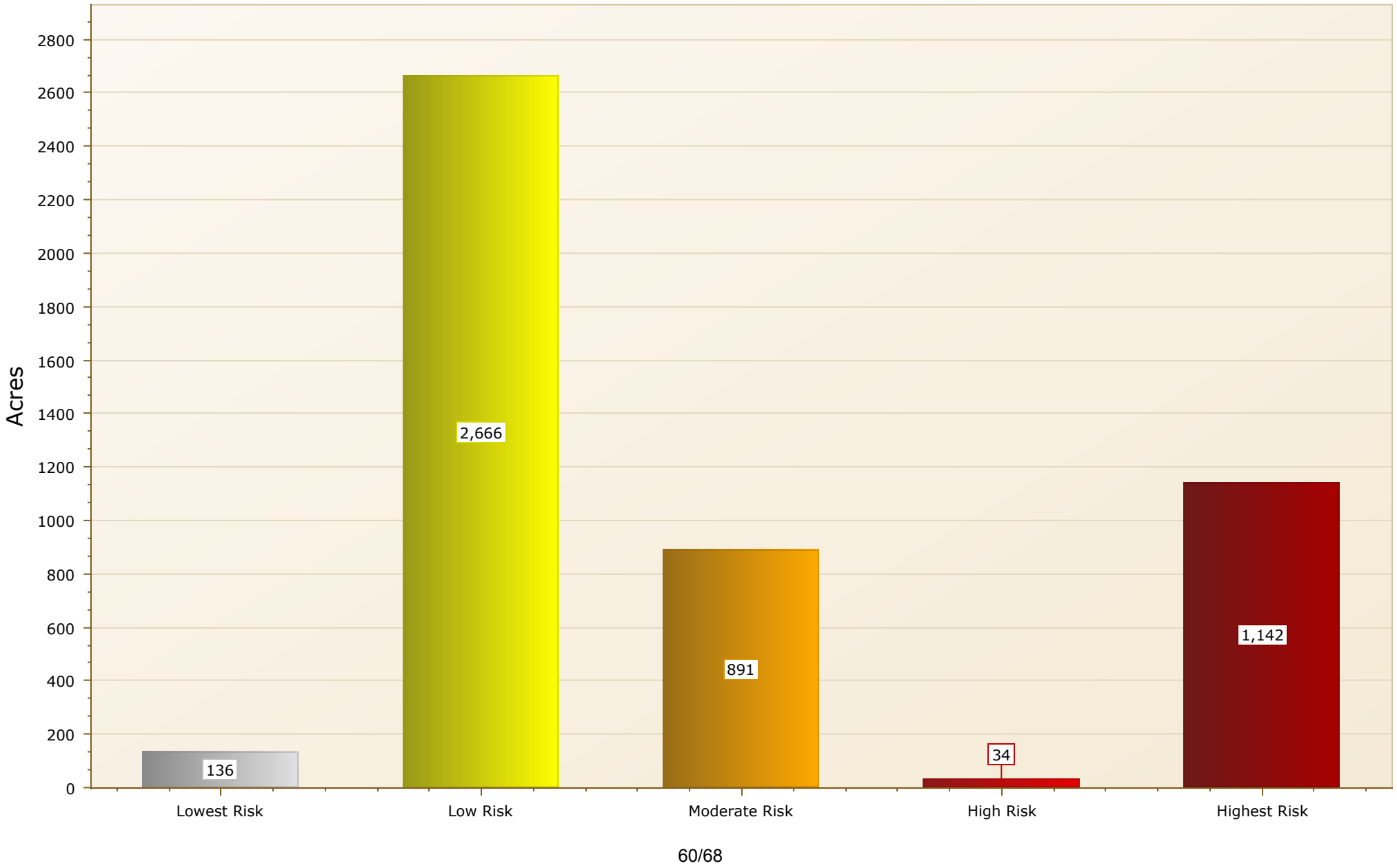
The risk index has been calculated by combining the Forest Assets data with a measure of fire intensity using a Response Function approach. Those areas with the highest negative impact (-9) represent areas with high potential fire intensity and low resilience or adaptability to fire. Those areas with the lowest negative impact (-1) represent those areas with low potential fire intensity and high resilience or adaptability to fire. The response function outputs were combined into 5 qualitative classes.

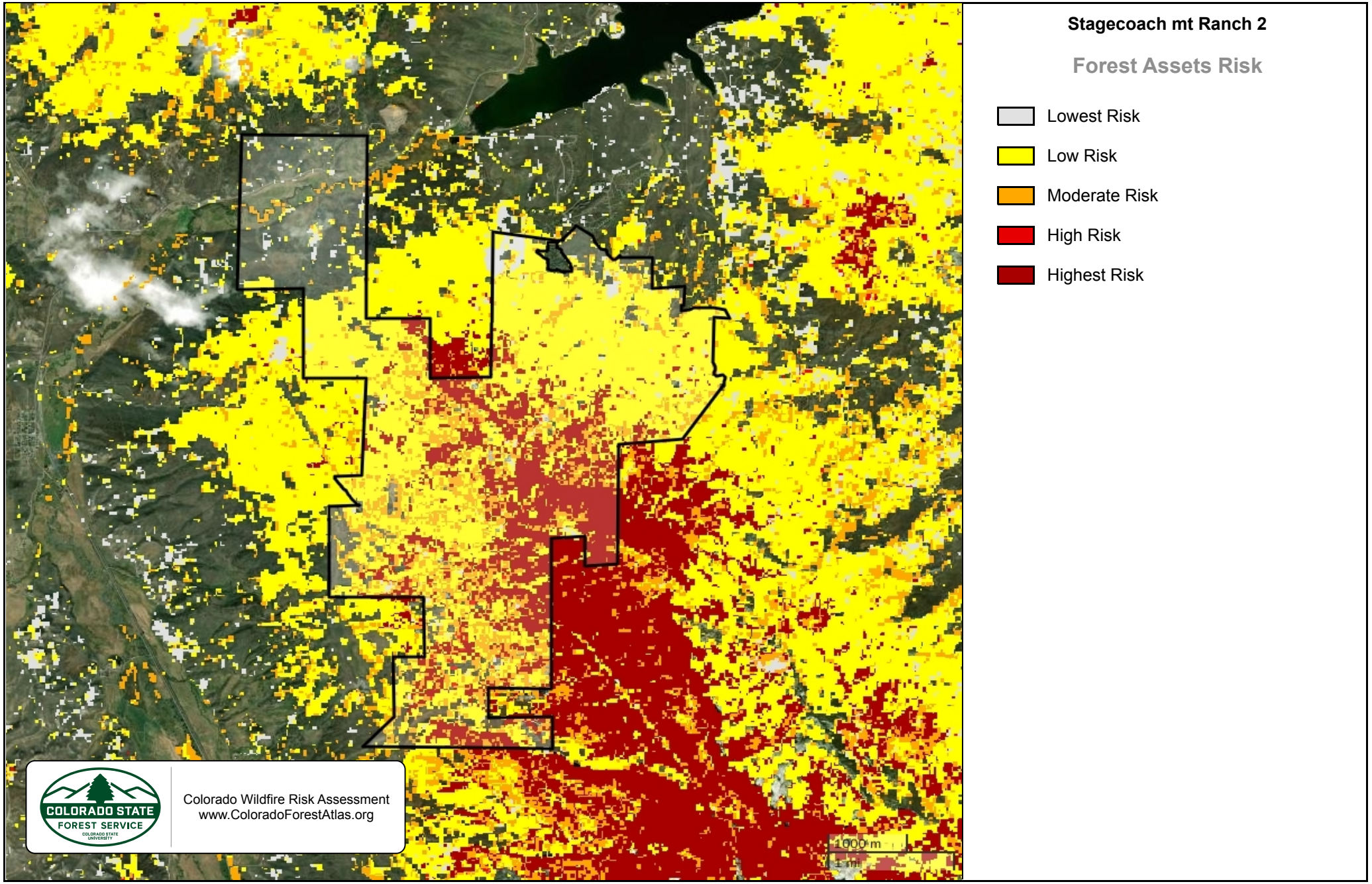
This risk output is intended to provide an overall forest index for potential impact from wildfire. This can be applied to consider aesthetic values, ecosystem services, or economic values of forested lands.

Forest Assets Risk	Acres	Percent
Lowest Risk	136	2.8%
Low Risk	2,666	54.8%
Moderate Risk	891	18.3%
High Risk	34	0.7%
Highest Risk	1,142	23.4%
Total	**4,868**	**100%**

Forest Assets Risk

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Forest Assets Risk
Lowest Risk
Low Risk
Moderate Risk
High Risk
Highest Risk
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Building Damage Potential

This metric estimates the potential for building loss and was derived using proprietary data from Technosylva Inc. on building damages that was created by analyzing 13 years of building damage data from state agency inspections after large fires.

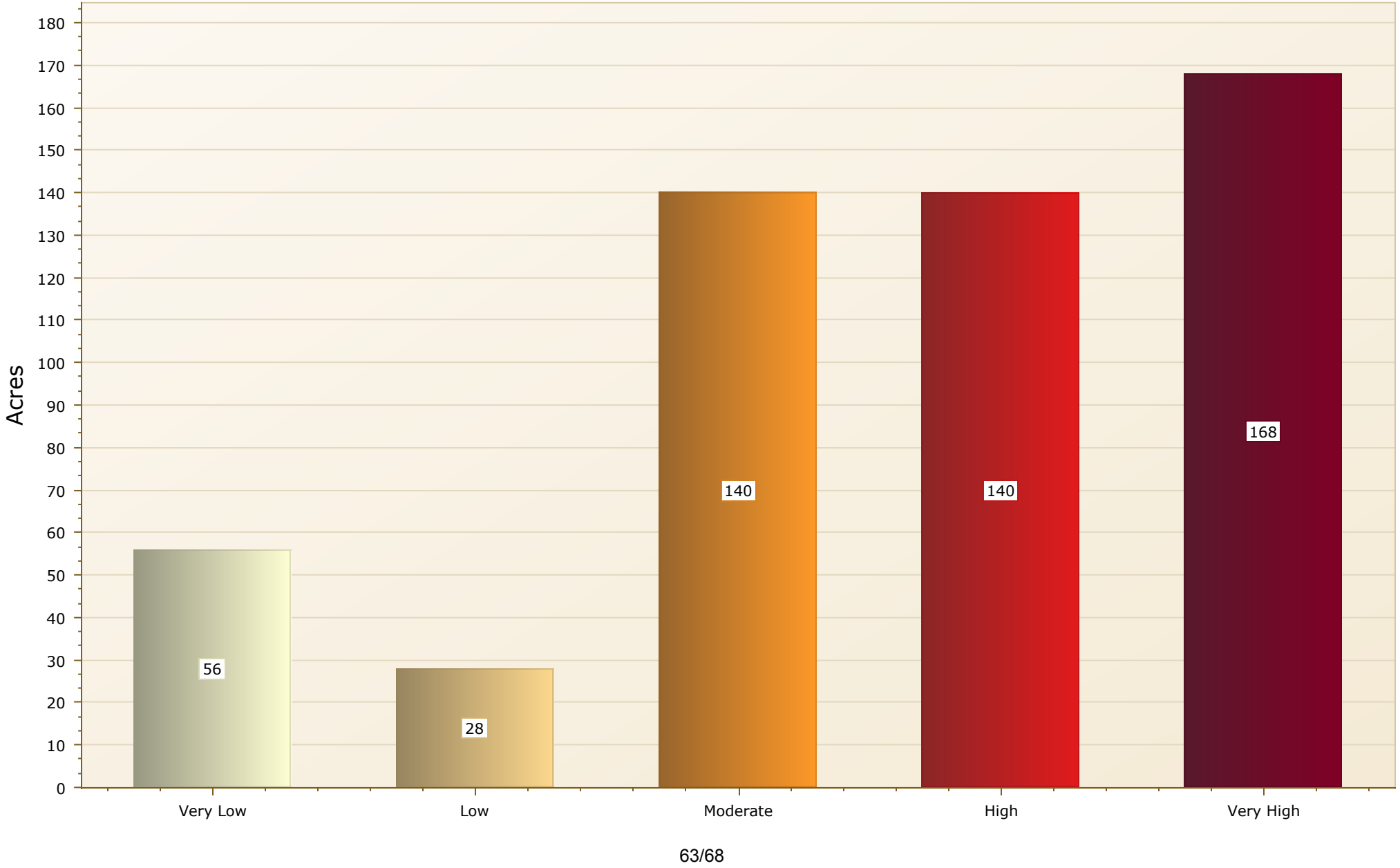
BDP is a spatially variable metric that is calculated on a building-by-building basis and aggregated to Uber H3 hexagons, providing a measure of the number of potential buildings lost based on the number of buildings threatened by fires in the specific area. BDP was calibrated using Machine Learning algorithms that identified the key factors that influenced building loss from historical damage inspection databases. The model has been calibrated using 13 years of damage inspection data and validated across multiple Western States with current wildfire data.

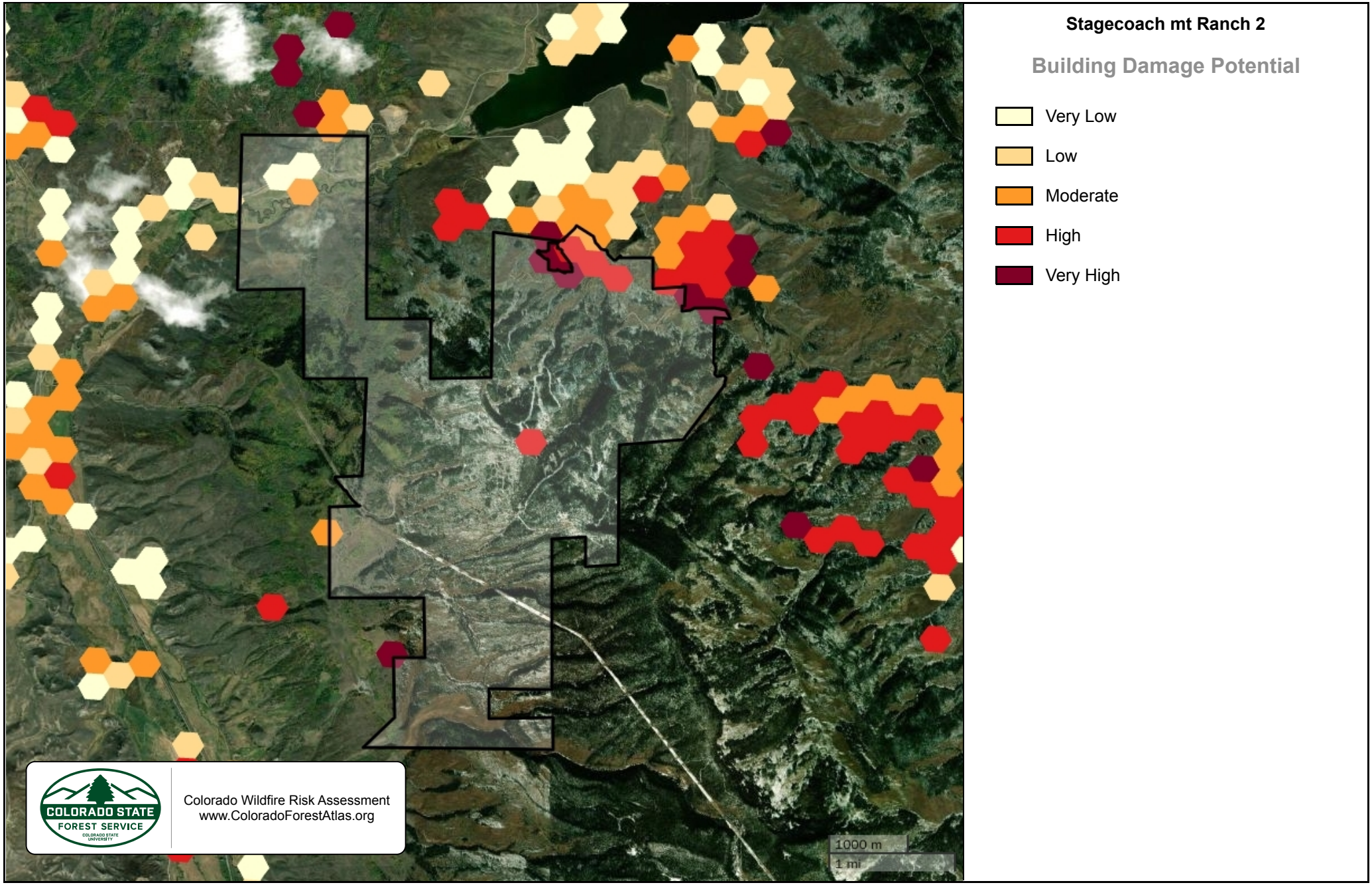
BDP is available as a static risk layer, although a key factor involved in the metric is conditional fire behavior. Conditional Flame Length derived in the fire behavior analysis conducted for the 2022 CO-WRA was used. However, the metric can also be used as a dynamic layer when modulated by the fire intensity of an active wildfire through conventional fire behavior analysis. Although applied as a static layer for the 2022 CO-WRA, the metric is used operationally in California by state agencies and private industry for risk forecasting

Building Damage Potential	Acres	Percent
Very Low	56	10.5%
Low	28	5.3%
Moderate	140	26.3%
High	140	26.3%
Very High	168	31.6%
Total	**532**	**100%**

Building Damage Potential

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Building Damage Potential
Very Low
Low
Moderate
High
Very High
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Defensible Space Index

The defensible space in a Wildfire Urban Interface (WUI) analysis context refers to the space that surrounds a specific building and can be used to define the hazard, or the exposure, to a wildfire occurrence. In this area, natural and manmade fuels are treated, cleared or reduced to slow the spread of wildfire near structures.

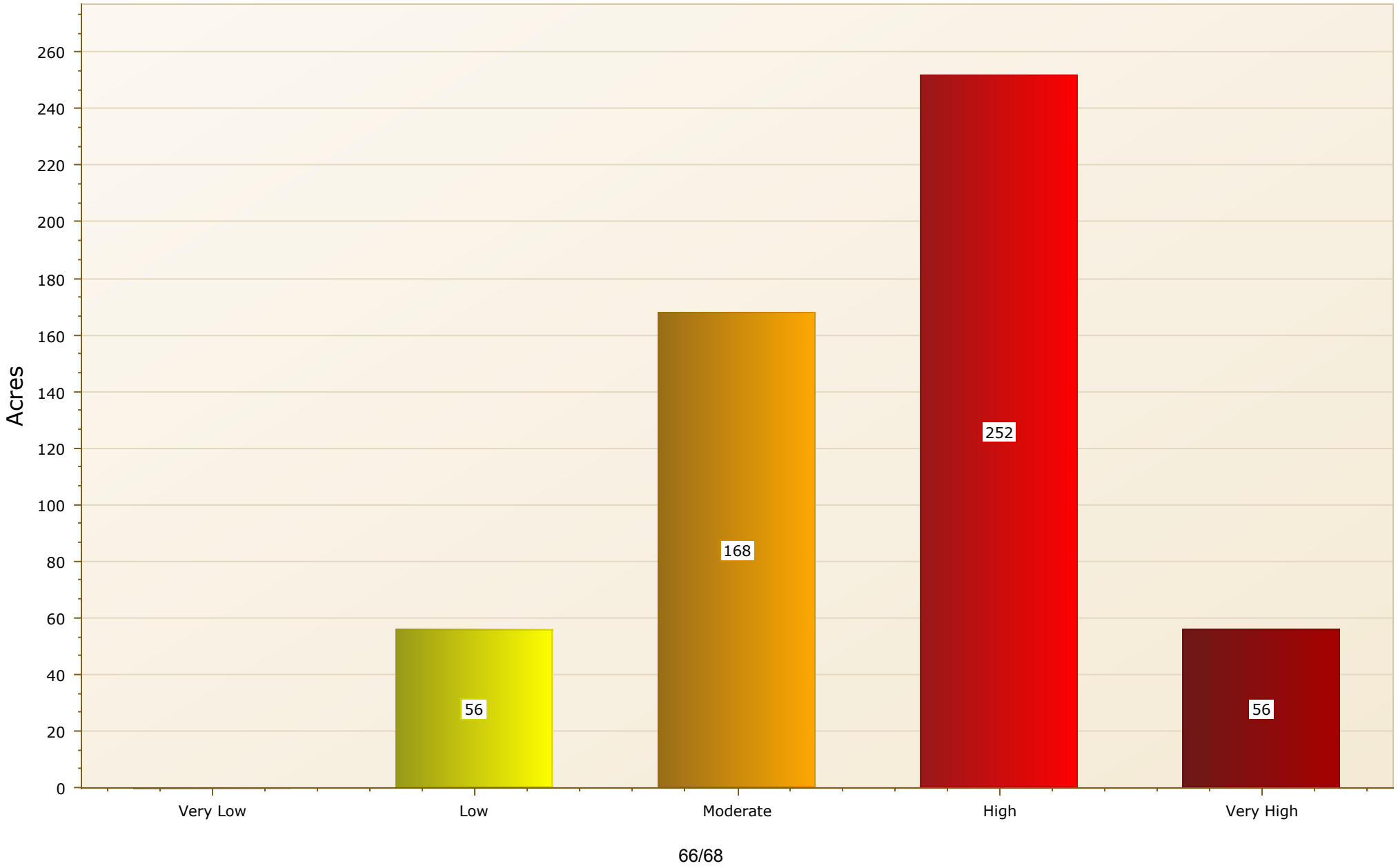
Individual building footprints were used to identify structure locations. Buildings were then grouped using Uber's hexagonal hierarchical spatial index. Within each hexagon, the building values were averaged and applied to the hexagon to remove building specific metrics. This provides a detailed measure of defensible space characteristics for small areas consistent with the accuracy of the structure locations and wildfire fuels and risk analysis data.

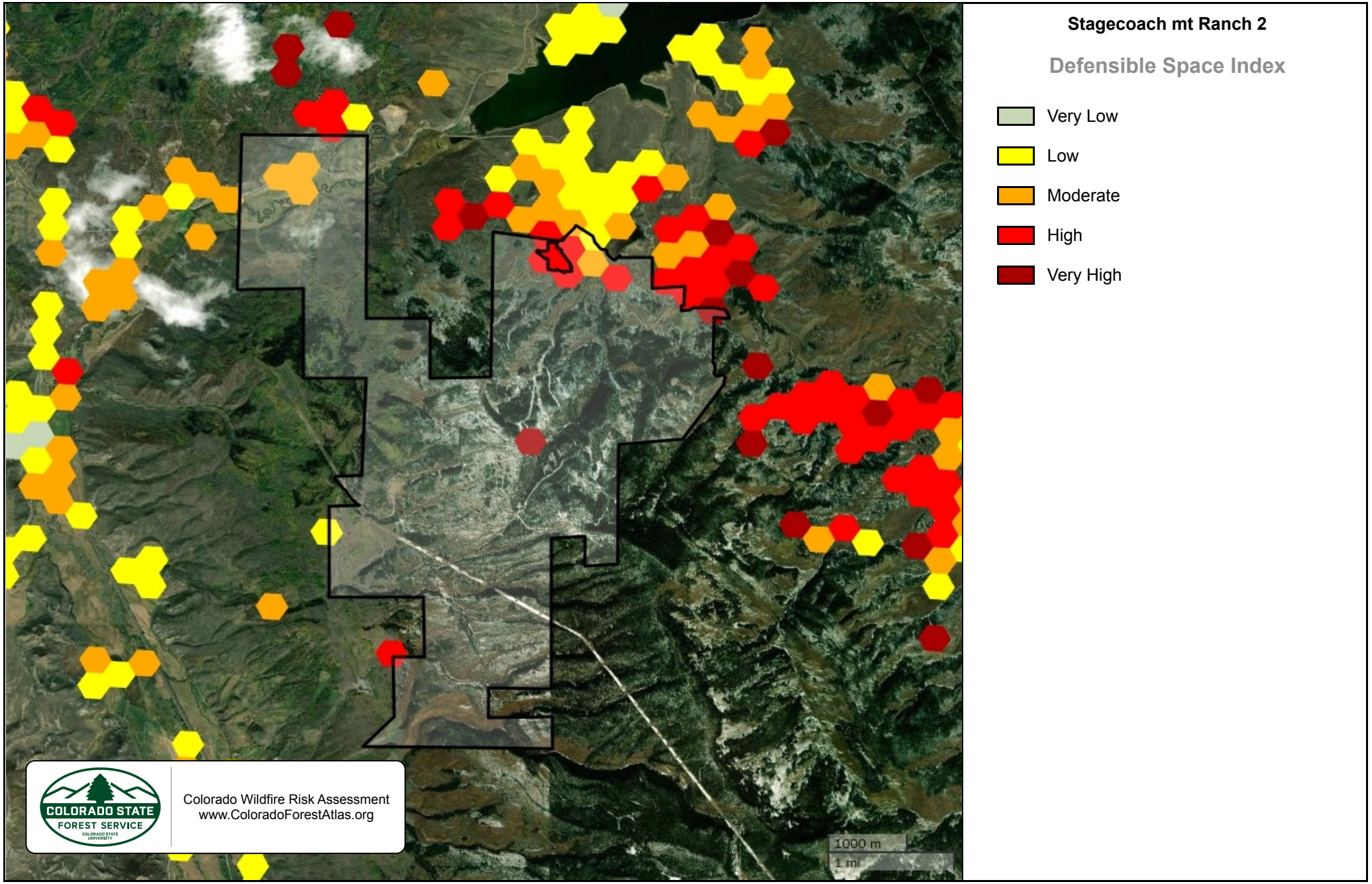
Each hexagon in the defensible space risk has a relative value from 0 to 1 that represents the average building hazard in that hexagon. This defensible space value is based on three spatial components/variables: 1) canopy cover, 2) slope, and 3) fuel models present within the buffer around the buildings analyzed.

Defensible Space Index	Acres	Percent
Very Low		0%
Low	56	10.5%
Moderate	168	31.6%
High	252	47.4%
Very High	56	10.5%
Total	**532**	**100%**

Defensible Space Index

Stagecoach mt Ranch 2




Stagecoach mt Ranch 2
Defensible Space Index
Very Low
Low
Moderate
High
Very High
COLORADO STATE FOREST SERVICE
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1000 m
1 mi

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EXHIBIT A

OAK CREEK FIRE PREVENTION SERVICES ADMINISTRATIVE POLICY & PROCEDURE MANUAL

DATE: **September 11, 2006**
PAGE: **1**

SUBJECT: Fire Apparatus Access Road Standards for the Oak Creek Fire Protection District

PURPOSE: To provide uniform guidelines for the establishment of Fire Apparatus Access Roads.

POLICY:

1.0 GENERAL PROVISIONS

Timing of installation. When fire apparatus access roads or a water supply for fire protection is required to be installed, such protection shall be installed and made serviceable prior to and during the time of construction except when approved alternative methods of protection are provided. Temporary street signs shall be installed at each street intersection when construction of new roadways allows passage by vehicles.

1.1 Where required: Fire apparatus access roads shall be required for every facility, building, or portion of a building**, other than an Exempt Agricultural Building (as defined below) while used solely for agricultural purposes,** hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet (45 720 mm) of all portions of the facility and all portions of the exterior walls of the first story of the building as measured by an approved route around the exterior of the building or facility. These provisions shall not apply to the addition to or remodeling, modification, upgrade, or replacement of existing structures unless such remodeling, modification, upgrade, or replacement increases the square footage of the habitable space of such existing structure by more than 50 %.

EXCEPTIONS: The fire code official is authorized to increase the dimension of 150 feet (45 720 mm) where:

1.1.1 The building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 (NFPA 13), 903.3.1.2 (NFPA 13R) or 903.3.1.3 (NFPA 13D).

1.1.2 Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection is provided.

1.1.3 There are not more than two Group R-3 or Group U occupancies. Table 1258.1D shall be used as a guide.

1.2 The fire code official is authorized to require more than one fire apparatus access road based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access. Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.

1.2.1 COMMERCIAL AND INDUSTRIAL DEVELOPMENTS

1.2.1.1 Buildings exceeding three stories or 30 feet in height. Buildings or facilities exceeding 30 feet (9144 mm) or three stories in height shall have at least two means of fire apparatus access for each structure.

1.2.1.2 Buildings exceeding 62,000 square feet in area. Buildings or facilities having a gross building area of more than 62,000 square feet (5760 m_2) shall be provided with two separate and approved fire apparatus access roads.

1.2.2 AERIAL FIRE APPARATUS ACCESS ROADS

1.2.2.1 Where required. Buildings or portions of buildings or facilities exceeding 30 feet (9144 mm) in height above the lowest level of fire department vehicle access shall be provided with approved fire apparatus access roads capable of accommodating fire department aerial apparatus. Overhead utility and power lines shall not be located within the aerial fire apparatus access roadway.

1.2.2.2 Proximity to building. At least one of the required access routes meeting this condition shall be located within a minimum of 15 feet (4572 mm) and a maximum of 30 feet (9144 mm) from the building, and shall be positioned parallel to one entire side of the building.

1.2.3 MULTIPLE-FAMILY RESIDENTIAL DEVELOPMENTS

1.2.3.1 Projects having more than 50 dwelling units. Multiple-family residential projects having more than 50 dwelling units shall be equipped throughout with two separate and approved
fire apparatus access roads.

Exception: Projects having up to 100 dwelling units may have a single approved fire apparatus access road when all buildings, including nonresidential occupancies, are
equipped throughout with approved automatic sprinkler systems installed in accordance with Section 903.3.1.1(NFPA 13) or 903.3.1.2 (NFPA 13R) of the International Fire Code.

1.2.3.2 Projects having more than 100 dwelling units. Multiple-family residential projects having more than 100 dwelling units shall be provided with two separate and approved fire apparatus access roads regardless of whether they are equipped with an approved automatic sprinkler system.

1.2.4 ONE- OR TWO-FAMILY RESIDENTIAL DEVELOPMENTS

1.2.4.1 One- or two-family dwelling residential developments.
Developments of one- or two-family dwellings where the number of dwelling units exceeds 30 shall be provided with separate and approved fire apparatus access roads, and shall meet the requirements of Section 1.2.

Exceptions:

1. Where there are 50 or fewer dwelling units on a single public or private access way and all dwelling units are protected by approved residential sprinkler systems, access from two directions shall not be required.
2. The number of dwelling units on a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the fire code official.

1.3 Road Signs and Building Identification: Signage and identification shall be guided by the current edition of the Manual of Uniform Traffic Control Devices as utilized by the City of Oak Creek. The AHJ can modify requirements of this section in private subdivisions on a case-by-case basis as long as the modifications meet desired life safety requirements. Additional signage may be required by the AHJ as deemed necessary including but not limited to address directories for subdivisions. Buildings must be clearly identified with an address sign that is visible from the intersection of the building driveway with the road. If the building address sign is not clearly visible from this intersection then a separate building address sign will be required at the intersection.

2.0 SPECIFICATIONS

2.1 Dimensions (width):

2.1.1 Common Roads serving 3 or more Buildable Lots or any commercial establishment: Fire apparatus access roads shall have an unobstructed width of not less than 22 feet. This width shall not include snow storage, parking or road shoulders. The unobstructed vertical clearance shall not be less than 13 feet 6 inches.

2.1.2 Common Driveways serving only 2 Buildable Lots: Fire apparatus access roads shall have an unobstructed width of not less than 16 feet. This width shall not include snow storage, parking or road shoulders. The unobstructed vertical clearance shall not be less than 13 feet 6 inches.

2.1.3 Driveways serving only 1 Buildable Lot: Fire apparatus access roads shall have an unobstructed width of not less than 12 feet. This width shall not include snow storage, parking or road shoulders. The unobstructed vertical clearance shall not be less than 13 feet 6 inches.

2.2 Surface: Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be provided with a surface so as to provide all-weather driving capabilities. Specifications shall meet Routt County hard surface or gravel road standards. Driveways shall be surfaced to provide a reasonable level of all weather access given the site conditions (grade, soil type, drainage, etc.), but should at a minimum consist of "3-inch minus" structural gravel at a depth of four inches (4").

2.3 Turning radius:

2.3.1 Common Roads serving 3 or more Buildable Lots or any commercial establishment: Fire apparatus access roads shall have a Minimum Centerline Turning Radius of 127 feet (see Fig. 1).

2.3.2 Common Driveways serving only 2 Buildable Lots: Fire apparatus access roads shall have a Minimum Centerline Turning Radius of 60 feet (see Fig. 2).

2.3.3 Driveways serving only 1 Buildable Lot: Fire apparatus access roads shall have a Minimum Centerline Turning Radius of 60 feet (see Fig. 3).

2.4 Dead Ends (turnarounds):

2.4.1 Common Roads serving 3 or more Buildable Lots or any commercial establishment: All dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved provision for the turning around of fire apparatus (see Fig. 4, 7A or 7B).

2.4.2 Common Driveways serving only 2 Buildable Lots: All dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved provision for the turning around of fire apparatus (see Fig. 5, 7A or 7B).

2.4.3 Driveways serving only 1 Buildable Lot: All dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved provision for the turning around of fire apparatus (see Fig. 6, 7A or 7B).

2.4.4 Variations to the above designs may be submitted using the AASHTO –"Turning Path &Traveled Way Designs for City Transit Buses" as a design basis. The minimum standard for cul-de-sacs shall be a 45 foot radius.

2.5 Grades: Common roads serving 3 or more Buildable Lots shall be designed under section 1100, Low Volume and Off System Roadways, of the CDOT Design Manual. Driveway grades shall not exceed 10%. Any curve with a radius of less than 80 feet shall have a grade less than 4% within 100 feet of the point of curvature of the curve or switchback. The fire apparatus road shall have a staging area with a minimum length of *60* feet and a maximum slope of 4% at the intersection with a public street/road. This policy may be modified based on Table 1258.1D or section 1.1.2 of this policy. Table 1258.1D is intended to apply to private driveways which serve as a fire apparatus access road.

2.6 **Turnouts:** Driveways in excess of 200 feet in length and less than 20 feet in width shall be provided with turnouts. Turnouts shall be an all-weather road surface at least 10 feet wide and 40 feet long (see Fig. 8). Driveway turnouts shall be located as required by the AHJ.

2.7 Bridges and elevated surfaces: Where a bridge or an elevated surface is part of a fire apparatus access road, the bridge shall be constructed and maintained in accordance with AASHTO Standard Specification for Highway Bridges. Bridges and elevated surfaces shall be designed for a live load sufficient to carry the imposed loads of fire apparatus. Vehicle load limits shall be posted at both entrances to bridges when required by the fire code official. Where elevated surfaces designed for emergency vehicle use are adjacent to surfaces which are not designed for such use, approved barriers, approved signs or both shall be installed and maintained when required by the fire code official.

3.0 PLAN SUBMITTALS:

3.1 Site construction: The provisions of this policy shall apply when building construction begins and thereafter. A site management plan shall be submitted with the building permit application showing how access shall be maintained. Applicant will need to include with the building plans a site plan showing the full length of the driveway to the residence and indicating the slope and final road material. The review process will include an initial site visit to confirm proposed layout of the driveway/roads and a final site visit when driveway/road is completed to confirm road standards

3.2 Areas requiring fire apparatus access roads or fire lanes shall be shown on the plans and shall be posted and maintained at all times.

3.3 Marking: Depending upon the nature of the access and the hazard of the occupancy, as determined by the AHJ, fire apparatus access roads may be required to post approved signs identifying and restricting obstruction of the fire apparatus access road. The cost and installation of these signs shall be the developer / owner's responsibility.

4.0 DEFINITIONS

- FIRE APPARATUS ACCESS ROAD - A road that provides fire apparatus access from a fire station to a facility, building or portion thereof. This is a general term inclusive of all other terms such as fire lane, public street, private street, parking lot lane and access roadway.

- DWELLING UNIT - is any building or portion thereof which contains living facilities, including provisions for sleeping, eating, cooking and sanitation as required by the Building Code, for not more than one family, or a congregate residence of 10 or less persons.

- AHJ - is the Authority Having Jurisdiction.

- BUILDABLE LOT – is any separate lot or parcel of land on which construction is permitted to occur in accordance with the zoning of land use regulations of the applicable jurisdiction. See Routt County Zoning Resolution, Section 13 Definitions, as amended.

- **EXEMPT AGRICULTURAL BUILDING -- is any building or structure that is exempt from the requirement that a building permit be obtained for such building or structure pursuant to Routt County Resolution 85-064, as amended by Routt County Resolution 02-044, and as it may be further amended from time to time hereafter.**

APPROVED BY: Chuck Wisecup / District Chief SIGNATURE: _____
DATE: _____

APPROVED BY: Oak Creek Fire Protection District Board, Chris Zuschlag, Board President

SIGNATURE: _____

DATE: _____

SUPERSEDES POLICY OF: January 14, 2003

Fire Apparatus Access Road Standards
Oak Creek Fire Protection District

_TABLE 1258.1D

Potential BUILDABLE LOTS served	Width	Greater than 150 feet	Greater than 200 feet	Grade	Staging area intersecting at public access
1 – BUILDABLE LOT (single family drive)	12 feet	Turn around required	Turn outs required	10 % or less as approved by AHJ	25' @ 4 % max.
EXCEPTION: If these widths and grades can not be obtained due to topography or other circumstances then additional fire protection such as fire alarm systems, fire sprinkler systems etc. may be required by the AHJ. **NOTE: No access road serving 1 Buildable Lot shall be less than 10 feet and where applicable a wildfire mitigation plan shall also be prescribed.**					
2 - BUILDABLE LOTS (common drive)	16 feet	Turn around required	Turn outs required	10 % or less as approved by AHJ	25' @ 4 % max.
EXCEPTION: If these widths and grades can not be obtained due to topography or other circumstances then additional fire protection such as fire alarm systems, fire sprinkler systems etc. may be required by the AHJ. **NOTE: No access road serving 2 Buildable Lots shall be less than 12 feet and where applicable a wildfire mitigation plan shall also be prescribed.**					
3 OR MORE BUILDABLE LOTS (common road)	22 feet	Turn around required	Turn outs not required	Per section 1100 of the CDOT Design Manual	50' @ 4 % max.
EXCEPTIONS: If these widths and grades can not be obtained due to topography or other circumstances then additional fire protection such as fire alarm systems, fire sprinkler systems etc. may be required by the AHJ. **NOTE: No access road serving 3 or more Buildable Lots shall be less than 20 feet and where applicable a wildfire mitigation plan shall also be prescribed.**					
COMMERCIAL ESTABLISHMENT (common road)	22 feet	Turn around required	Turn outs not required	7 % or less as approved by the AHJ	75' @ 4 % max.
EXCEPTION: If these widths and grades can not be obtained due to topography or other circumstances then additional fire protection such as fire alarm systems, fire sprinkler systems etc. may be required by the AHJ. **NOTE: No access road serving a commercial establishment shall be less than 20 feet and where applicable a wildfire mitigation plan shall also be prescribed.**					

NOTE: The intersection angle to Public Access Street shall be approved on a site-specific basis.

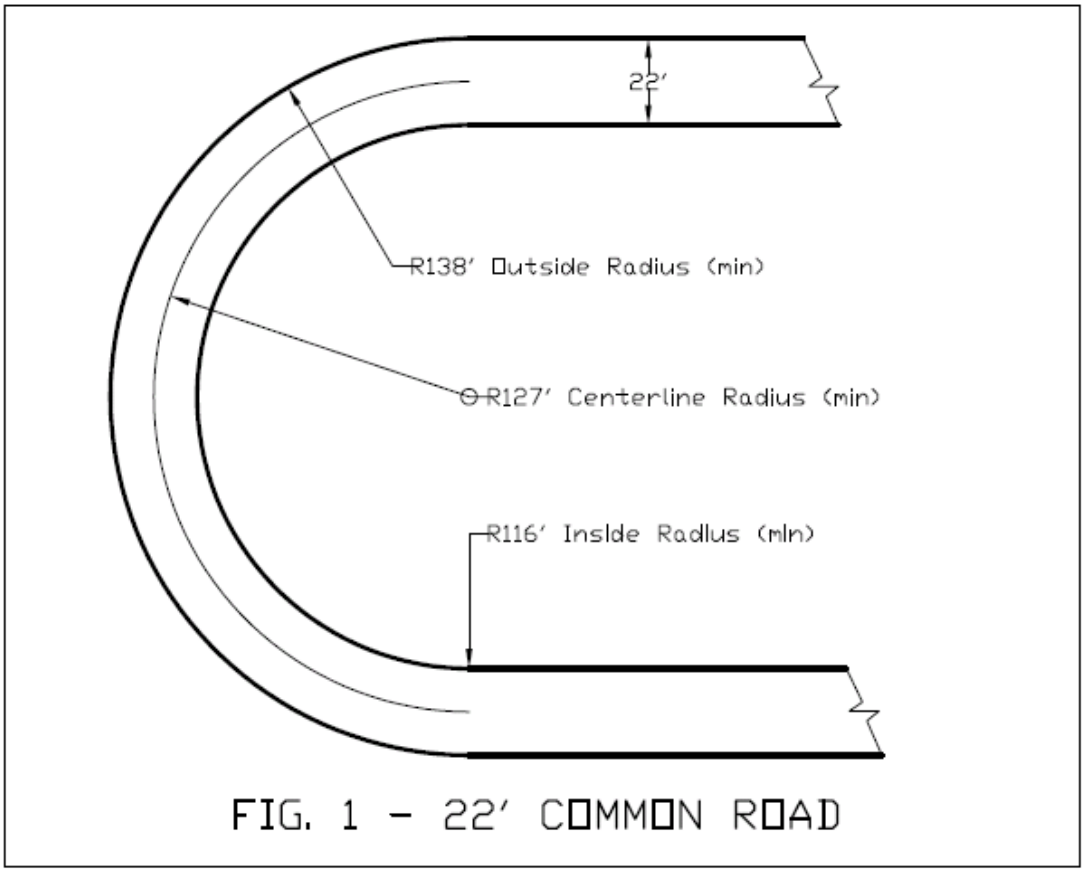

FIG. 1 - 22' COMMON ROAD

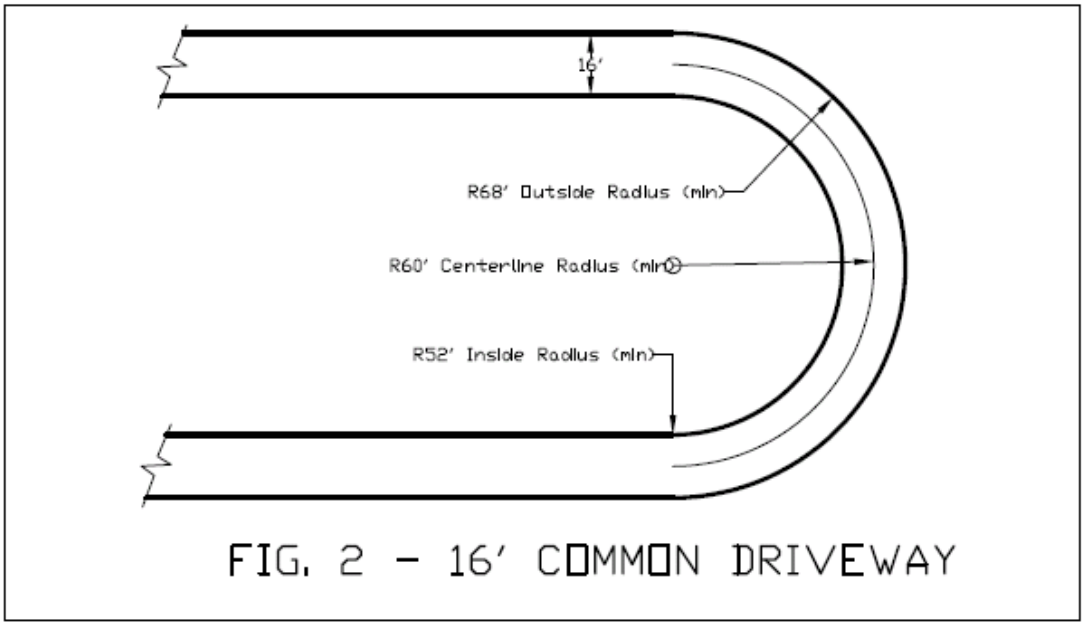

FIG. 2 - 16' COMMON DRIVEWAY

Steamboat Springs Rural Fire Protection District	Fire Apparatus Road Standards
	Drawn by: BSB
PO BOX 775088 STEAMBOAT SPRINGS, CO (970) 871-8216 FAX (970) 871-6306	Scale: N.T.S. Date: 6/27/06
	Revision description:
	Sheet number of

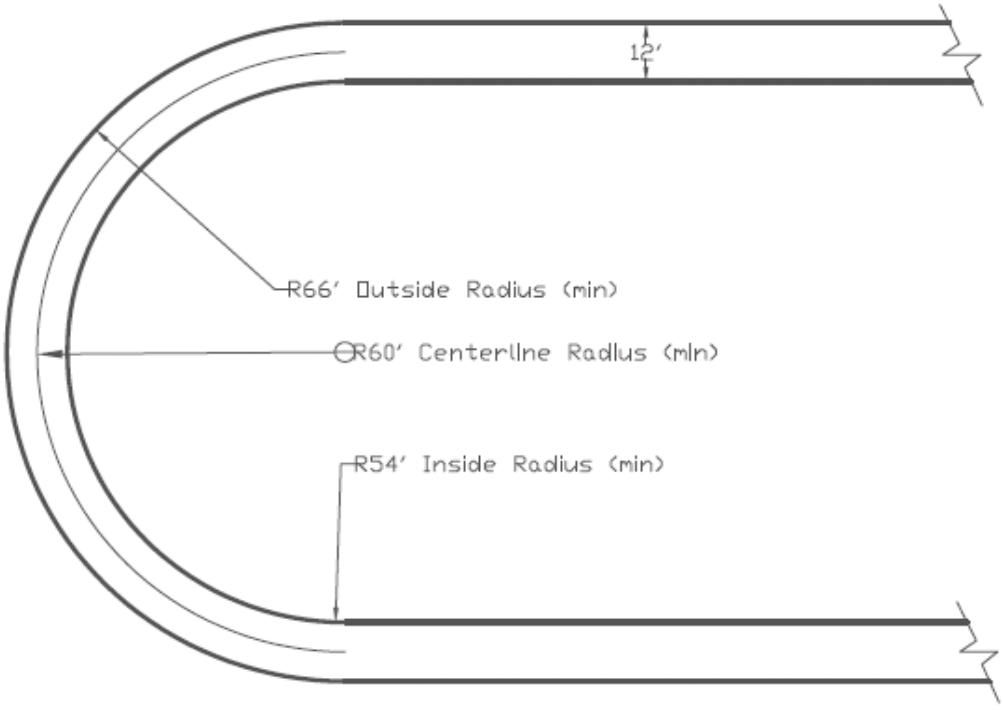

FIG. 3 - 12' DRIVEWAY

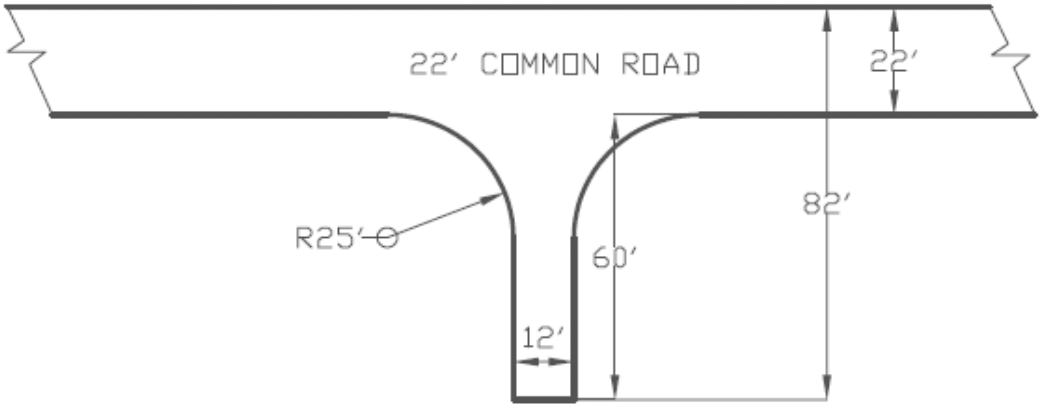

FIG. 4 - 22' T-TURNAROUND

Steamboat Springs Rural Fire Protection District	Fire Apparatus Road Standards
	Drawn by: BSB
PO BOX 775088 STEAMBOAT SPRINGS, CO (970) 871-8216 FAX (970) 871-6306	Scale: N.T.S. Date: 6/27/06
	Revision description:
	Sheet number of

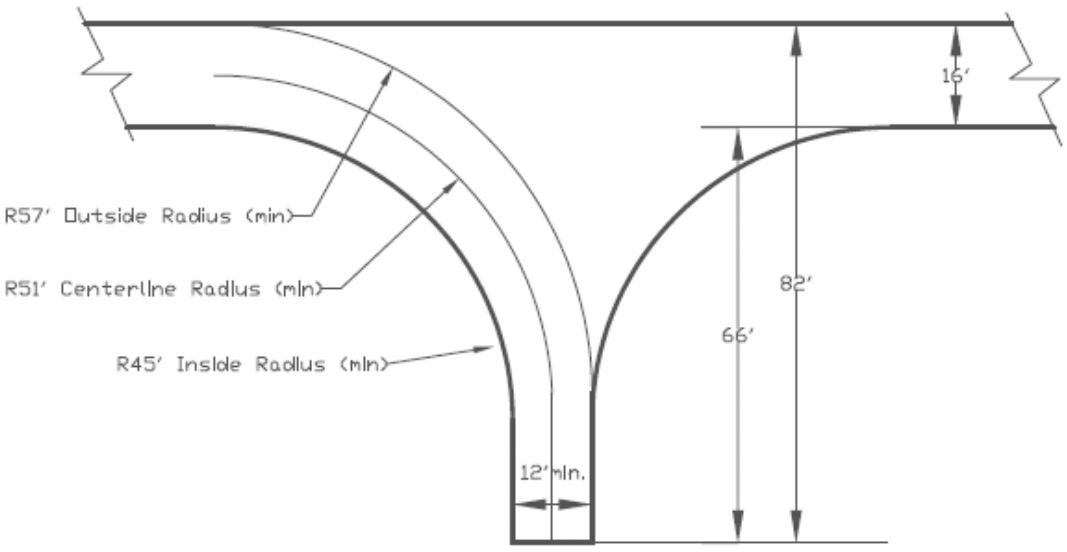

FIG. 5 - 16' T-TURNAROUND

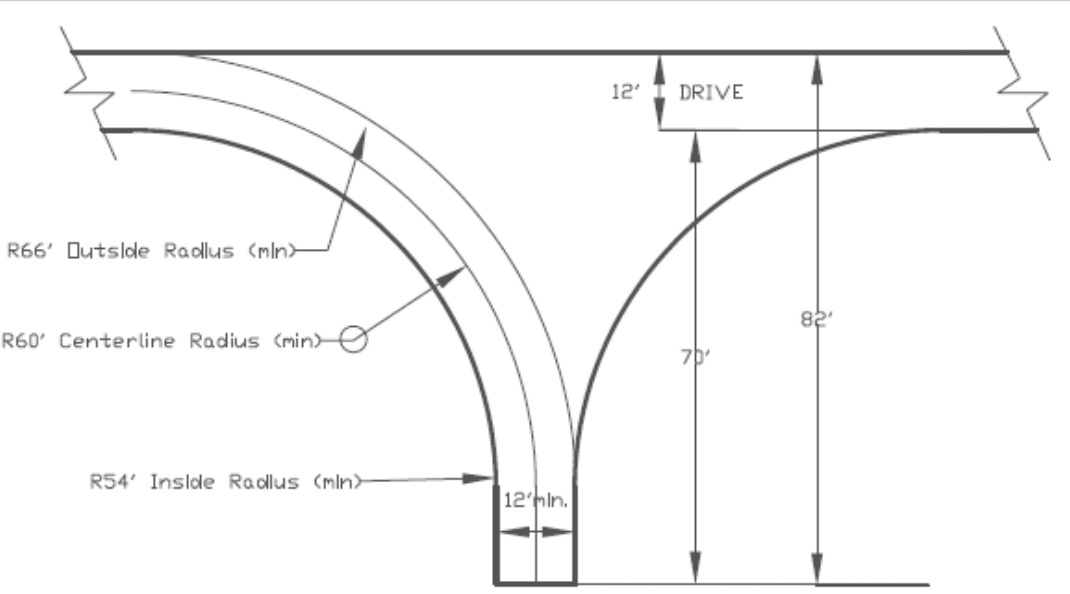

FIG. 6 - 12' T-TURNAROUND

Steamboat Springs Rural Fire Protection District	Fire Apparatus Road Standards
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PO BOX 775088 STEAMBOAT SPRINGS, CO (970) 871-8216 FAX (970) 871-6306	Scale: N.T.S. Date: 6/27/06
	Revision description:
	Sheet number of

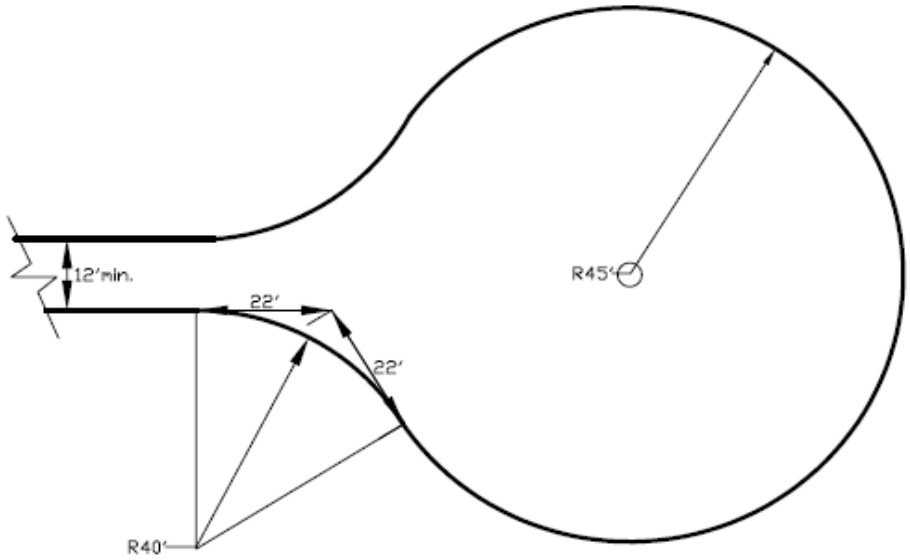
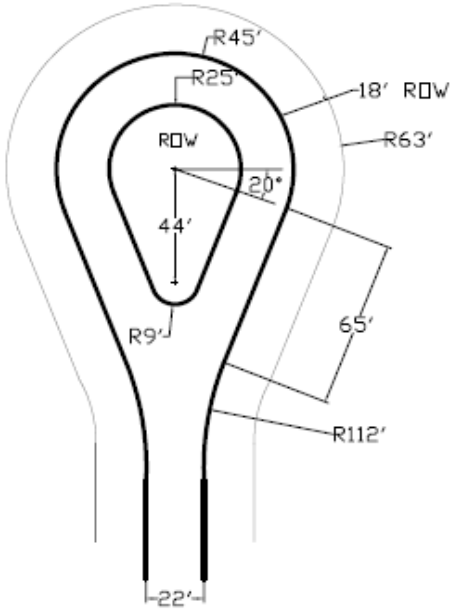


FIG. 7A – STANDARD CUL-DE-SAC



NOTE:

1. MINIMUM PARAMETERS ARE SHOWN ASSUMING IDEAL CONDITIONS BASED ON AASHTO TURNING MOVEMENTS FOR CITY TRANSIT BUS (CITY-BUS) DESIGN VEHICLE. VARIATION FROM THESE STANDARDS MAY BE REQUIRED TO ACCOMODATE ACTUAL SITE CONDITIONS.

2. CUL-DE-SAC DESIGN MUST BE APPROVED BY THE PUBLIC WORKS DIRECTOR.

3. CUL-DE-SAC APPROACH SHALL BE ALIGNED TO ENCOURAGE COUNTER-CLOCKWISE CIRCULATION. IN NO WAY SHALL THE ROADWAY APPROACH BE ALIGNED WITH THE RETURN FLOW OF THE CUL-DE-SAC.

4. ISLAND LANDSCAPING SHALL BE PRIVATELY MAINTAINED.

5. LANDSCAPING SHALL CONSIST OF NATIVE PLANT MATERIAL OR OTHER AS APPROVED BY THE PUBLIC WORKS DIRECTOR. ALL ELEMENTS MUST PROVIDE APPROPRIATE SIGHT DISTANCE FOR CUL-DE-SAC USERS.

6. CUL-DE-SAC SHALL BE MARKED ON BOTH SIDES AS A FIRE LANE INDICATED BY PERMANENT "NO PARKING - FIRE LANE" SIGNS. SIGNS SHALL HAVE A MINIMUM DIMENSION OF 12 INCHES WIDE BY 18 INCHES HIGH AND HAVE RED LETTERS ON A WHITE REFLECTIVE BACKGROUND.

FIG. 7B – MODIFIED CUL-DE-SAC

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	Revision description:
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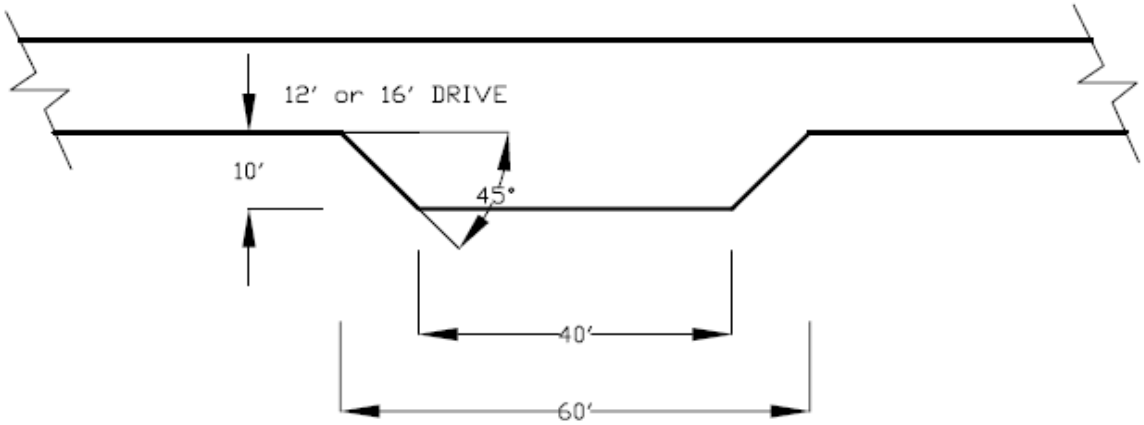

FIG. 8 - STANDARD TURNOUT

Steamboat Springs Rural Fire Protection District	Fire Apparatus Road Standards
	Drawn by: BSB
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	Revision description:
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