Texas A&M AgriLife Extension

Wildfire: Preparing the Ranch

Message from the Director

Over the last decade, wildfires have inflicted multi-million-dollar losses on Texas agriculture and communities. Since 2015, four major wildfire complexes in the Panhandle have severely impacted rangelands, presenting significant environmental and management challenges for producers, wildlife, and livestock.

In 2024 alone, the Panhandle wildfires — the largest and most costly in Texas history — resulted in an estimated $123 million in short-term agricultural losses. These fires consumed 1.2 million acres, leading to the death of more than 12,000 cattle, substantial losses in forage production, and the destruction of hundreds of miles of fencing. Additional losses extend to other critical ranching infrastructure, including barns, corrals, water well pumps, windmills, and feed supplies, which total $68.7 million in damages.

This educational resource has been developed to equip Texas agriculture producers and residents with the knowledge and tools needed to prepare for future wildfires. It draws on the expertise of the Texas A&M AgriLife Extension Service, the agency's Disaster Assessment and Recovery agents, and the Texas A&M Forest Service — all part of The Texas A&M University System.

We extend our gratitude to the Texas Legislature for their continued support of our agencies and their unwavering commitment to safeguarding communities and the agricultural livelihoods of Texans across the state.

Rick Avery, Ph.D.
Director, Texas A&M AgriLife Extension Service

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Wildfire: Preparing the Ranch

Introduction

Ranchers and landowners are continuously adapting to droughts, floods, extreme temperatures, market fluctuations and prolonged wildfire seasons. Decisions and preparation before smoke is on the horizon are key to ranching the good years in between and after wildfires.

Changing weather patterns, human activity and the ever-growing number of people moving to rural lands have increased wildfire risks and resulted in an extended wildfire season. Annual records dating back to 1983 indicate that four of the five largest wildfire years for acreage burned in the U.S. have occurred since 2015 (2015, 2017, 2020, and 2024, respectively) (https://www.nifc.gov/).

Extended dry periods, droughts and increased lightning frequency are becoming more common. This, coupled with more and longer periods of elevated temperatures and high winds, results in drier vegetation and increases the probability of ignition. The Great Plains has experienced the most significant increase in human-related wildfire events of any U.S. ecoregion (Balch et al., 2017). As people and infrastructure rapidly expand into rural landscapes, wildfire impacts increase due to the extended length of the fire season and the growing expanse of wildfire-affected acres.

The Texas Panhandle region has seen fires throughout its history, with 90% of the largest wildfires in Texas recorded in the months between January and May. By 2050, the number of days with wildfire danger in Texas could increase by as many as 40 days per year with high heat and dry periods significantly lengthening the wildfire season (Yu et al., 2023)

The Texas High Plains are subject to the Southern Plains Wildfire Outbreak (SPWO) as ranchers and landowners have endured record-setting wildfires in 2006, 2017, and 2024.

SPWO was first characterized in 2005 and refers to swarms of at least 10 fires that ignite on the same day and collectively burn at least 10,000 acres across the grass-dominant landscapes of the southern Great Plains. These events occur when the environment is characterized by dry vegetation, dry west-southwest winds across an area with low humidity, above average surface temperatures, an unstable atmosphere and clear, sunny skies (National Weather Service, 2018). SPWO events are similar to those that promote severe storms and comparable to violent EF-rated storms. Fires during SPWO are atmospheric events which organize heat release from the surface (Pyne, 2021).

Since 2005, SPWO fires account for 3% of reported wildfires but have accounted for 49% of the acres burned. Historically, SPWO events happen more often during La Niña years. La Niña conditions typically translate to warmer and drier than normal conditions for Texas during the winter and spring months. These conditions increase the potential for high impact wildfire weather and SPWO events.

Signs of an early and intense wildfire season

Accumulation of fine fuels from an above-average rainfall season should put landowners into wildfire management mode as quickly as possible. The goal is not to immediately overgraze or overstock, but rather to start preparing and planning for the accumulated fine fuels for the upcoming dormant or winter season. The winter fire season, also called the dormant fire season, is caused by cold fronts bringing dry air to the state, while the freeze-cured grasses and high winds increase wildfire intensity. The summer wildfire season is due to high heat and extended drought conditions. Most grazing animals will not consume dry, dormant perennial grasses so the most optimized time to use grazing as a tool is when native, perennial forage is still palatable and preferred.

Key online tool: The Texas A&M Forest Service's Predictive Services Department provides short and long-term forecasts and analysis for fire potential at: https://ticc.tamu.edu/PredictiveServices/.

Risk Management

Insurance

Insurance must be in place before tragedy strikes. One of the first steps in managing risk through insurance is to call or schedule a meeting with an insurance agent for a policy review to ensure desired and adequate coverage is achieved.

Simple questions need to be asked and answered:

- Does the policy cover wildfire damage?
- To what extent?
- In what amount?
- Are hay storage, solar pumps, fences, equipment and outbuildings covered and to what amount?
- What about livestock killed by wildfire? What about emergency forage, especially if fences and forage are burned?

Multiple policies with multiple companies may be required, depending on specific needs. Insurance is likely to be the primary way that landowners and ranchers recover losses after a wildfire. However, additional programs can be found on the U.S. Department of Agriculture Disaster Assistance program page, https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/index to assist producers dealing with immediate forage loss due to a disaster event.

New insurance policies are emerging that take into consideration pre-vegetative management strategies that build defensible space prior to wildfire seasons. These policies such as the Wildfire Protection Program from Nationwide will provide consultants to inspect properties for wildfire susceptibility and provide recommendations for prevention. This policy also enrolls member's properties into wildfire monitoring and notification and can arrange for pre-suppression action as

well as offer response services including sprinkler setup, fuel break preparation and the application of fire-blocking gel or retardant. Working with local Extension county agents, USDA offices, or farm/ranch insurance providers can be beneficial when getting started.

Documentation and Communication

Keep important documents such as birth certificates, social security cards, estate planning documents, insurance information, animal registration and birth records, vehicle titles/registration, photos, and heirlooms stored in fire- and waterproof boxes. Better yet, have original documents stored off-site or electronically accessible from any Wi-Fi connection.

Include an up-to-date written, photographic or video accounting and inventory (accompanied by written inventory) of all personal and farm/ranch property. Do not forget to include items in barns, sheds, shops and outside such as equipment or tack. Back up photos and videos on secure cloud-based services, including scanned images of photographs or videos.

Hard copy maps are an undervalued and underutilized resource. Keep plenty of maps in responding vehicles of the ranch showing roads, water locations, terrain, pastures, gates, acreage, and updated management considerations such as plowed ground, recently grazed, burned, sprayed, etc. This will benefit first responders tremendously, especially if this is the first time to the ranch or pasture. These maps can take on many forms, but do not need to be fancy or detailed, but rather convey big picture considerations for Volunteer Fire Departments. Additional resources from Texas A&M Forest Service may be beneficial. For example, the Landowner Priorities and the Map My Property Application (https://tfsweb.tamu.edu/ProtectYourRanch/) are advantageous planning resources to discuss as an operation and with local Volunteer Fire Departments (VFD's) and community leadership like Emergency Management Coordinators (EMC).

These resources are most efficiently used in preparation for wildfires before active fire is threatening resources. Hard copies of maps, landowner priorities, and contact information should be given to VFDs and EMCs for community preparation. Participating in a county's emergency animal issues plan with AgriLife Extension is also an option to develop plans for evacuations, equipment lists, facilities, etc. USDA Web Soil Survey is another public access mapping tool (https://websoilsurvey.nrcs.usda.gov/app/). This resource is less practical in a response situation, but can be instrumental in a planning capacity to show what parts of the property are best suited for different types of resources, i.e. motor graders, different types of trucks, etc.

Grazing Management for Wildfire Mitigation

Appropriate and strategic grazing management can be applied in anticipation of fire season even prior to forage transitioning to fuels with the dormant winter season. Moderate grazing decreases wildfire probability by decreasing fuel amount, continuity, and height and increasing fuel moisture content. Grazing, through its modification of fuels, can improve fire suppression efforts by decreasing flame lengths, rate of fire spread, and fire severity (Davies et al., 2022). The use of grazed fire breaks, salt/mineral locations, and feed trails along with burned out two-tracks can be

uniquely created based on headquarters, pens, and traps that routinely house livestock and infrastructure. Grazing rotations can also be strategically managed, so the order of grazed pastures is timed with the upcoming fire season. These grazing bouts can occur with higher utilization rates earlier in the fire season where blocks of reduced fuel loads are present along with easy access to rotate in and out depending on nearby fire threats.

Landowners should view every acre like a battle general including "the back 40" where existing roads are enhanced with hoof action from feeding (mineral, salt, cake, etc..) or high-intensity grazing in water lots that provide options for defensible space in pastures and next to structures. As wildfire season approaches, think creatively to use grazing to reduce fuels closest to structures. This may look like a flash graze or even a water lot that surrounds headquarters or structures. Build a looping road around structures and headquarters and feed animals off that road to maximize hoof action during dormant months prior to wildfire season. Do not become complacent and take every opportunity to congregate animals in locations that buffer structures.

Considerations for Preparing Livestock

When wildfire season begins to approach, implementing a rotation plan that brings the animals closer to headquarters for either flash grazing or potential evacuation can be advantageous. Pre-planned rotation management with specific considerations for herd/fire location are key when having to move quickly and efficiently. Contact information on gate signs can be advantageous if pastures border highways or heavily trafficked county roads. Better yet, ranch tours with Volunteer Fire Department members and chiefs can be implemented prior to fire season so that all first responders are aware of cattle rotations, gate locations and pasture accessibility. Efficient communication with first responders is key. Maintaining a list of 911 addresses and other location info such as maps with marked waters and roads for each pasture should be kept in all farm vehicles and easily accessible.

Ideally, livestock should be moved to an area that is open ground free of any vegetation. Cattle that are easily gathered and move is a must. Some producers make an effort to routinely supplement feed with a learned behavior of a car horn or siren prior to wildfire season in case a quick gather is necessary due to approaching wildfires. This strategy works well with mature cows and even yearlings, however, calves will likely be more difficult move and/or gather. Having a livestock moving/gathering plan ahead of time with specific direction of animal movement considerations relative to herd/fire location on the ranch is extremely advantageous. If managing calves during wildfire season, producers can strategically analyze their pasture rotation and ideally calve in a pasture that is well protected and buffered from fire.

Further thought may be put into calving season and potentially shifting calving to springtime or growing season (May-June) to avoid wildfire season altogether. Tilled or disked cropland is the most preferred emergency space for livestock; however, recently grazed pastures or traps may suffice. Livestock managers may put additional feed sources out in order to keep animals content and in place despite heavy smoke. If animals are already in pens as a fire approaches or closely passes by,

livestock health considerations should still be factored in and closely monitored immediately following the fire front. If headquarters and pens are sufficiently prepped and buffered then livestock will be buffered from direct fire. However, smoke inhalation and radiant heat exposure can certainly cause damaging effects. Each operation and operator's plan will vary based on the risk level and amount of preparation at headquarters and working pens. Livestock owners should keep readily accessible veterinarian first aid supplies on-hand and inventoried prior to each fire season.

Another important consideration in preparing livestock for wildfire season is a current cattle inventory. Ideally, keep an updated, readily accessible list of every animal in each pasture including calves. This is also equally important if operations include exotic wildlife species that can be aggressive if first responders are in a pasture. This information can also be important after the fire when fences are down and livestock owners are being tracked down.

In rural areas, it may be beneficial to develop community-wide staging plans with developed inventories of equipment available from neighbors such as heavy machinery, aerial equipment, maintaining spray equipment as suppression equipment during the wildfire season to rapidly act early on ignitions and assist in local response. Other considerations for rural communities are an established lookout system tied into neighbor notifications through GroupMe, a mobile group messaging app to rapidly alert communities with current information. In rural areas/communities, a warning system (TechRadium's IRIS warning system) sends alerts for several types of emergencies via cell phone.

Firebreaks

Recent wildfires in the Texas Panhandle have shown that even four-lane paved highways cannot contain all wind-driven wildfires. However, what they can do is buy time and allow anchor points for suppression crews to enhance or widen. In the pasture, another word for firebreak is a road. These roads are multi-purpose and allow landowners to check perimeter fence, provide accessibility to the pasture, and can serve as a safe anchor point for wildfire suppression.

Firebreaks should be constructed by removing vegetation and exposing bare ground or mineral soil. This is done to keep the fire from creeping across the firebreak and escaping from the burn unit. Bare ground firebreaks are the safest to work with, but not the only type that can be used. For example, roads, streams, creeks, or other bodies of water, crop fields, disked firebreaks, mowed firebreaks, train tracks, right-of-ways, anything that offers a reduction in fuel quantity and fuel structure can be enhanced during burn out operations or anchored from for ground and aerial suppression. Firebreaks serve several purposes, but the most crucial is to contain the fire within the boundary of the burn unit.

Some of the best firebreaks are those that have been scraped to bare ground by a road grader/maintainer or other heavy equipment. Ideally, only the fine fuel is removed with little soil movement. Done properly, these firebreaks can be made economically with minimal erosion. Scraped firebreaks also provide a corridor for equipment and personnel to travel on savely and

quickly. The main consideration for scraped lines is to find an equipment operator who is reliable and understands the goal to be accomplished. Often, equipment operators are not accustomed to scraping only the surface without moving a lot of soil. It is also best to have the scraped soil (berm) placed away from the pasture (rolled out of the burn area) to reduce fuel build up that, if ignited, can smolder for days causing potential problems on the line.

When developing a firebreak, try to minimize potential erosion problems. On steep slopes, it may not be advisable to take the firebreak down to mineral soil. Instead, a mowed line/wet line (a line of water, or water and chemical retardant, sprayed along the ground, and which serves as a temporary control line from which to ignite or stop a low-intensity fire) firebreak may be the best option. Mowed line/wet line firebreaks and some hand line firebreaks can cause problems because they contain flammable material that may allow the fire cross if not closely monitored. For this reason, they should be limited to as short of distance as possible.

There are several options that can minimize soil erosion on bare ground firebreaks. One option is to make water bars (i.e. terraces, cut-outs) to reduce channeling of the water. A second option is to use J-checking on plowed, disked, or dozed firebreaks, where the water is diverted every so often in the shape of a "J". This prevents the water from following a long, continuous path and diverting it into or out of the burn unit onto the side slope. Still another option to reduce erosion is to plant a cover crop on the firebreak. When doing this, make sure the crop you plant is fire resistant and that it is green and actively growing when the unit is burned. Wind erosion on sandy soils is not a problem even with firebreaks that have been maintained for several years.

Infrastructure Protection

Utility Easement Management

A recent five-year study conducted by the California Department of Forestry and Fire Prevention found that electrical power causes nearly 10% of wildfires annually (Electrical System Safety, 2022).

The best way to reduce wildfire risk in right-of-way areas is to selectively control receptive fuel beds of trees and brush species throughout corridors. This selectivity is crucial, as it allows vegetation managers to eliminate threats to utility infrastructure while strengthening wildfire mitigation programs.

Utility vegetation managers can use Integrated Vegetation Management (IVM) strategies to avoid receptive fuel beds. IVM programs use integrated industry best management practices and complement mechanical and biological control methods with targeted applications of selective herbicides, which strengthen woody plant management and minimize off-target control issues.

As a result, industry practitioners can successfully yield landscapes that are compatible with not only utility infrastructure but also wildfire mitigation programs. Landowners and managers may also attempt IVM practices by reducing fire hazards along utility easements through intensive grazing,

maintaining short cutting, bladed lines under the ROW, or maintaining fewer ladder fuels during wildfire season following excessive accumulation of fine fuels like grasses.

Hay/Silage Storage and Protection

Stored hay is a very receptive fuel bed for embers. It is best to spread hay storage locations across the ranch to reduce the risk of it all burning at once. Some insurance companies will only insure a specific number of hay bales or a total value of hay in a stack, as well as having a required distance between insured haystack locations. Confirm any of these details with an insurance agent for specific policy details, such as tons/rolls of hay in one location.

If possible, strategic planting of crops such as wheat fields or food plots or around designated emergency grazing and holding areas can aid as a buffer to suppression to activities or firebreak.

- Store hay on bare ground if possible.
- Mow or graze fuels down next to hay storage.
- Create firebreaks around stored hay by blading or disking to bare ground.
- Remove or reduce volatile fuels, such as cedars and junipers, around storage sites.
- Follow recommended fuel reduction practices as outlined for structures.
- Store hay away from buildings, equipment or other items that may be damaged by burning hay bales.
- If fires are likely to come from a specific direction, place hay on the opposite side of roads, ponds or other firebreaks to reduce the probability of fire reaching the bales.

Outside Equipment Storage

Many of the principles regarding defensible space for structures also apply to toolsheds and equipment sheds or congregated equipment.

- Park equipment at least 20 feet from other vehicles and buildings.
- Park equipment on cement pads, bare ground or gravel. If this is not possible, regularly mow or graze vegetation in and around equipment.
- Before parking, remove vegetation that has collected on or under equipment during operation.
- Keep all wind-blown debris, such as tumbleweeds, from collecting around equipment.
- Make sure equipment is not leaking fuel or other flammable fluids.
- Wash equipment if fuel or fluids have leaked on equipment.
- Keep all windows and doors on equipment closed to keep embers out.

Building Maintenance and Construction

If in the middle of a remodel, update, or new build, think fire. Just like fences, rooftops are very vulnerable, mainly because they have the greatest potential for ignition from embers. Using nonflammable roofing materials can substantially reduce the risk of a structure catching on fire when embers fall on the rooftop. Class A roofing material (asphalt glass fiber composition shingles,

metal, concrete tile, slate, clay tile) are effective against fire exposure and have been tested for fire resistance and dependability.

Additional considerations for maintenance and construction include:

- Replace or repair loose or missing shingles or other roofing material.
- Make sure eaves and exterior attic vents have screens in place to keep out flying embers; 1/8-inch mesh wire screen is recommended.
- Repair or replace damaged window screens and windows.
- Screen or box in areas around patios and below decks to prevent embers or combustible materials from accumulating.
- Repair or replace rotten or damaged wood siding preferably replace with a fire resistive siding like cement fiberboard.
- Make sure wooden privacy fences are not attached directly to the house; metal gates can serve as a safety buffer.
- Choose fire-resistant material for decks, patio furniture, swing sets and other items.
- For barns and other buildings, make sure embers cannot enter through openings under the eaves. Place 1/8-inch metal screen material in these openings to keep embers out.
- Select fire-resistant building materials for new construction, add-ons or remodels.

Firewise Landscaping and Defensible Space at Headquarters

Investing in Firewise USA® landscaping and fuel mitigation around headquarters, homes, structures, and barns can buy extra time or enable suppression efforts to other resource concerns during a wildfire event. Research around structure destruction versus survival in wildfires points to embers and small flames as the main way that most homes ignite during wildfires. Embers are burning pieces of airborne wood and/or vegetation that can be carried more than a mile through the wind and can cause spot fires and ignite homes, debris and other objects. There are methods for homeowners to prepare homes to withstand ember attacks and minimize the likelihood of flames or surface fire touching the home or any attachments. Experiments, models and post-fire studies have shown homes ignite due to the condition of the home and everything around it, up to 200' from the foundation. This is called the Home Ignition Zone (HIZ) (Figure 1). Even though these recommendations were developed for homes, the same approach can be applied to barns, shops and other outbuildings.

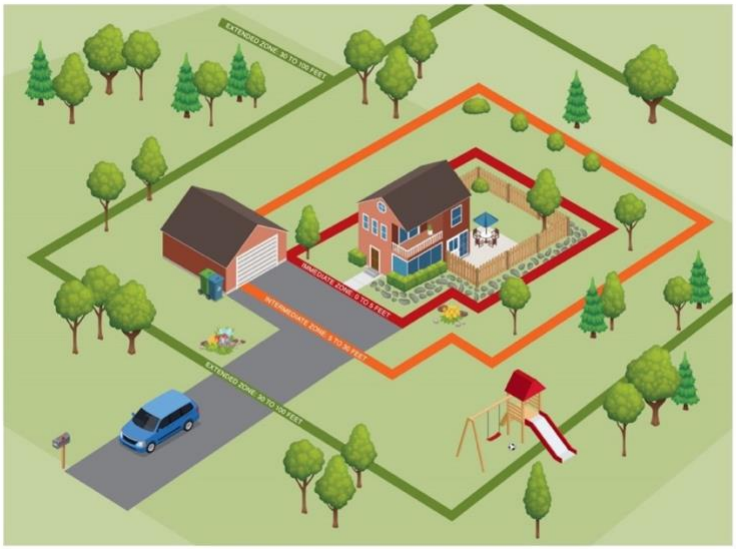

Figure 1. Experiments, models and post-fire studies have shown homes ignite due to the condition of the home and everything around it, up to 200' from the foundation. This is called the Home Ignition Zone (HIZ). Concepts adopted from Firewise USA®.

There are three main zones of concern around homes and buildings: immediate, intermediate and extended. Just a small amount of preparation, immediately around homes and structures, such as trimming lawns, removing tall vegetation, pruning trees and shrubs and cleaning roofs and gutters of flammable debris can buy extra time in a wildfire event. If possible, strategic planting of crops such as wheat fields or food plots around headquarters or around designated emergency grazing and holding areas can be advantageous as a buffer.

Immediate Zone
Within 5 feet of a home, barn or building

- The most important zone.
- Complete this zone first.
- Remove leaves and debris from roof and gutters.
- Do not store flammable items (including propane grills) under or adjacent to deck or patio.
- Move all flammable materials away from exterior walls, including mulch, flammable trees and shrubs, leaves, firewood piles, lumber piles and other combustible items.
- Consider using non-combustible mulch, such as crushed stone or gravel around homes or buildings.
- Choose landscape plants that are low-growing and free of resins, oils and waxes that burn easily. Space them carefully.

Intermediate Zone
5 to 30 feet from a home, barn or building

- Create firebreaks around homes and other structures with strategically placed driveways, sidewalks, walkways, patios and non-flammable decks.
- Mow or graze lawns and native vegetation to heights of less than 4 inches.
- Prune trees from the ground to 10 feet up from the soil surface to remove any ladder fuels.
- Remove vegetation and flammable mulch from under trees to reduce the risk of surface fires moving into tree crowns.
- Plant or thin trees within 30 feet of a structure to have at least 18 feet between canopies, increasing the distance on steeper slopes.
- Plant trees in locations where the mature canopy will not be within 10 feet of a structure.
- Trees and shrubs within 30 feet of structures should be limited to small groups or clusters to reduce fuel continuity.
- Aboveground propane tanks should be placed the proper distance from the home or other buildings as recommended by National Fire Protection Association: 125-to-500-gallon tank: 10 feet; 501-to-2,000-gallon tank: 25 feet.
- Aboveground fuel storage tanks should be placed well away from structures, preferably on gravel or concrete pads.
- Clear and keep vegetation from growing under propane and fuel storage tanks.

Extended Zone
30 to 200 feet from a home, barn or building

- Use driveways and roads to create firebreaks.
- Dispose of heavy accumulations of litter, debris and brush piles.

- Remove dead trees.
- Mow or graze to reduce fuel loads.
- Do not allow small cedars/junipers to grow under or between mature trees.
- Plant or thin trees within 30 to 60 feet from a structure to have at least 12 feet between canopies, increasing the distance on steeper slopes. Plant or thin trees within 60 to 200 feet from a structure to have at least 6 feet between canopies. Increase the distance on steeper slopes.
- Consider removing all highly flammable trees, such as cedars or junipers, within 200 feet of a structure.
- Place firebreaks inside fence lines along roads to help reduce wildfire risk on light wind days; however, do not expect this to effectively stop a fire on extremely windy days.
- Conduct prescribed burns to create blackened areas around structures before wildfire season; make sure to burn before conditions become too dry or burn bans restrict the ability to burn.
- Planned grazing can also be used to reduce or manage fuels and wildfire risk in this zone.

Tree spacing (Figure 2) is also a crucial element to keep wildfires on the surface instead of in tree canopies. Mature trees should be spaced out 30-100 feet with a minimum of 18 feet between tree tops nearest to structures out to 200 feet, remembering the goal is not to eliminate fire but to interrupt fire's path and keep flames smaller and on the ground.

Tree Spacing Considerations

- Dispose of heavy accumulations of ground litter/debris.
- Remove dead plant and tree material.
- Remove small conifers growing between mature trees.
- Remove vegetation adjacent to storage sheds or other outbuildings within this area.
- Trees 30 to 60 feet from the home should have at least 12 feet between canopy tops.*
- Trees 60 to 100 feet from the home should have at least 6 feet between the canopy tops.*

*The distances listed for crown spacing are suggested based on NFPA 1144. However, the crown spacing needed to reduce/prevent crown fire potential could be significantly greater due to slope, the species of trees involved and other site-specific conditions. Check with your local forestry professional to get advice on what is appropriate for your property.

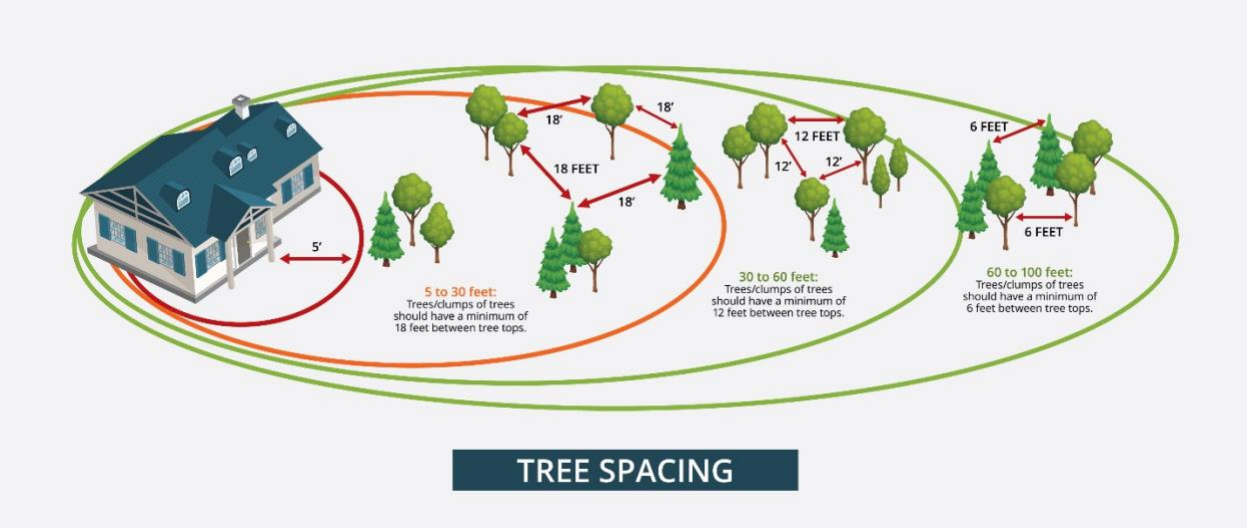

Figure 2. Tree spacing near structures is also a crucial element to keep wildfires on the surface instead of in tree canopies. Mature trees should be spaced out 30-100 feet with a minimum of 18 feet between treetops nearest to structures out to 200 feet, remembering the goal is not to eliminate fire but to interrupt fire's path and keep flames smaller and on the ground. Concepts adopted from Firewise USA®.

Ready, Set, Go!

"Ready, Set, Go!" is administered at the fire department level. This program helps communities learn how to protect homes ahead of time, stay informed of current fire dangers and evacuate safely if a wildfire is bearing down on a community.

Ready, Set, Go! is based on a three-pronged approach:

1. Ready: A home and family should be ready long before a wildfire ignites. Creating defensible space through proper landscaping techniques and using fire resistant building materials designed to withstand wildfire are parts of this step.
2. Set: When a wildfire is approaching, it is time to start preparing to leave. Alert family and friends. Stay tuned to news reports. Grab an emergency kit and be ready to head out at a moment's notice. Having a plan for what items will be taken and to where evacuation will occur is critical.
3. Go! Once the fire front has crossed onto the property trigger or critical threshold, evacuation is necessary. At this point, it is time to go!

Livestock Evacuation Plan

Protecting livestock from wildfire can be dangerous. Entering into an unburned pasture with significant fuel loads, limited time, and limited escape routes to open gates or cut fences is

inherently risky. Be aware of the fire location, direction and rate of spread before making a decision to enter a pasture. Anyone unaware of this critical information should not enter.

- Do not try to herd animals in front of an oncoming wildfire; this is extremely dangerous.
- Maintain gates so they open easily and without tools.
- Prepare safe areas or firebreaks for livestock by maximizing trampling along fence lines and in pasture corners through strategic salt and mineral placement or winter feeding.
- Manage fuel loads with timing, intensity, distribution and duration of grazing.
- Consider using patch-burning techniques to create firebreaks and safety areas.
- May conduct prescribed burns on a regular basis to reduce fuel loads and volatile fuels.
- Create firebreaks and maintain roads along pasture perimeters to reduce fuels, as well as making safe areas for livestock to congregate.
- Have a livestock evacuation plan that considers how and where livestock will be taken in the event of a wildfire.
- Carry fence pliers to cut a rapid escape route if trapped by fire.

Evacuation timing

Don't wait. People who evacuate early are more likely to avoid being caught in traffic jams or worse trapped by smoke and fire. Have a plan with contingencies on the roads taken to evacuate. If possible, have communication with a neighbor or first responder on check-in points. Also, attempt to track the fire in real-time to stay current on rates-of-spread and direction. Several mapping tools with wildfire layers are available on smartphones such as Google Maps, Apple Maps, and OnX Hunt. There are also active fire mapping apps available such as Watch Duty that relies on providing real-time updates as conditions change, active fire perimeters and progress, infrared satellite hotspot, and evacuation orders and shelter information. TFS has a free resource for monitoring current fires in Texas (https://tfswildfires.com/). It will show a general location, number of acres affected, and percent contained. The version available to the public does not show fire boundaries or resources assigned to the fire, but emergency responders can request an account that gives specific access to the information. However, no technology can replace local knowledge of fire behavior and on-the-ground information from first responders and all resources should be as appropriate and necessary.

What to do if wildfire is approaching?

(from Firewise USA®, NFPA, FEMA)

The following recommendations are considerations from national fire prevention programs devoted to homeowners and communities and focused on mitigating wildfires planning for emergency evacuations such as Firewise USA® and the National Fire Protection Association. Landowners should be familiar with these concepts prior to fire season rather than trying to learn in stressful situations where span-of-control (the number of individuals or resources that one supervisor can manage effectively during an incident) may be limited. High winds, heat, dense smoke, lofting and flying sparks and embers, and the noise of a wildfire is completely unnerving and causes panic.

If wildfires are in the area, a reliable fire weather forecast to monitor the situation can be found at the Fire Weather Dashboard (https://www.weather.gov/dlh/fwd) that delivers hourly fire-specific data including wind, relative humidity, and other factors to gauge fire behavior and growth. However, despite all these assessments of predicting future fire direction and rates, wildfires are unpredictable. Even the best-laid plans can go amiss. Take the time to develop and thoroughly plan for ways to keep family, livestock, and property safe.

Preparing for Approaching Wildfire

- Know where to find the latest news and updates from the local media and fire department and check frequently during a wildfire event. The situation can change rapidly.
- Make sure to have important phone numbers readily available: fire department, county sheriff and neighbors.
- Have a livestock evacuation plan that considers how and where livestock will be taken in the event of a wildfire.
- Recommended emergency evacuation prioritization list: people, prescriptions, important documents, personal needs, keepsakes and valuables.
- Place an emergency supply kit and other valuables in your vehicle.
- Call for assistance if needed but remember emergency response resources may be limited or tied up at other sites.
- Make sure vehicles used to evacuate or haul livestock have plenty of fuel.

Preparing to Evacuate

- Close all entrances, windows and openings to homes and buildings. This includes doors, garage doors, windows, vents and any other entrances. This action is recommended to prevent embers from blowing in and igniting inside the structure.
- Close shutters, heavy drapes, blinds or other window coverings to reduce radiant heat exposure to items near windows.
- Turn on outside and inside lights to make house more visible in dense smoke.
- Move patio or deck furniture, cushions, doormats and potted plants in wooden containers either indoors or as far away from the home, shop or barn as possible.
- Turn off natural gas at meter or propane/ butane at the tank.
- Back vehicles into garage or outdoor buildings, then close the doors. If parking the vehicles inside is not an option, park them heading in the direction of the nearest evacuation route. Put emergency kits into vehicles and leave keys in the ignition. Make sure windows are rolled up. You may think about disconnecting the automatic garage door opener, so that exiting becomes easier if the power goes out.
- Turn on sprinklers and hoses around the house to potentially reduce the likelihood of ignition.
- Keep a fire extinguisher and fire tools accessible at all times. A shovel, rake, ladder, and 100 feet of attached garden hose can be used to extinguish spot fires.
- Protect yourself. Wear leather gloves, sturdy boots, and wool or cotton clothing.

Staying After Evacuation Order

After an evacuation order is issued, the decision to stay in the face of danger such as wildfire, hurricane or tornado is a personal decision, but it is not advisable. Worst-case wildfire scenarios include high winds with blowing embers and debris. An added complication is that fire may arrive in the middle of the night, making visibility even more difficult. Evacuation is the prudent choice. The choice to stay in a structure when a wildfire is approaching is discouraged. Should a person decide to stay, that decision should only be made if adequate preparations have been made well ahead of time (i.e., not in the hours before a fire arrives). For example, all the recommendations in the three home-ignition zones should have already been implemented. Firewise USA® recommendations for construction and maintenance should have been followed to reduce the risk of ember ignition. Understand that it may be impossible to mitigate for heavy smoke and that smoke inhalation may lead to injury or death.

- Have a shovel and rake, along with several long water hoses set up and accessible.
- Fill buckets and bulk containers with water.
- Have items set up in an accessible spot outside the home.
- Protective clothing such as cotton/wool clothing, including long pants, long-sleeved shirt, safety glasses, cap and leather gloves should be worn. Avoid synthetic material.
- Wildfires often take out power lines and rural water, which can reduce or eliminate pressurized water supplies. Do not base a fire-fighting strategy on having this water supply available.
- Prepare structures by spraying down adjacent fuels next to structures as well as roofs, hay, anything that is a fine fuel conducive for ignition and adjacent to structures.

If Evacuation Becomes Necessary

- Close all doors, including interior doors and windows.
- Leave as early as possible. Promptly leaving clears roads for firefighters to get equipment in place to fight the fire.
- Notify someone when leaving home and intended evacuation location.
- Make sure vehicle lights are on.
- Drive slowly; watch for other vehicles, people on foot, or loose livestock.
- If possible, avoid driving through dense smoke.
- Take your family to a safe location; be aware that a wind shift can make a previously safe location unsafe.

What to do if Trapped in a Vehicle

In the event a person becomes trapped in a vehicle (car, truck, cab tractor, or other equipment with a cab) with fire advancing, or vehicle becomes stranded in front of a fire, do not try to get out and outrun the fire. Roll up the windows and turn on the air conditioner to recirculate air inside the vehicle. This will help minimize smoke from getting inside the vehicle. Try to park the vehicle in an area away from heavy fuels, such as brush and trees. If possible, put an obstacle between the vehicle and the flames (e.g., another vehicle, building, concrete wall) to shield the radiant heat.

Leave the engine running and get down as low as possible from the windows to shield from radiant heat. Cover face and exposed skin with dry fabric. Try and remain calm and do not exit until the flames have passed. While it will get hot and smoky as fire passes, people are able to breathe inside the vehicle. The tires on the vehicle may burst due to heat and possibly catch on fire, as will some of the wiring and other plastic items. The vehicle will not explode. Stay in the vehicle until the fire passes. If the vehicle is drivable, move along; if not, get out and assess the situation.

What to do if Trapped in a House or Building

- It is safer to stay inside a house than go outside in a burnover situation.
- A house will provide protection from heat and flames.
- Shut all doors, windows and vents.
- Close shutters, heavy drapes, blinds or other window coverings to reduce radiant heat.
- Move to the center of the house until the flaming front passes, then move towards the side from which the fire approached, where the air may be less smoky and escape more feasible.
- Assess the situation during and after flaming front.

Conclusion and Master Checklist

Living with wildfire can be stressful, and, unfortunately, no two fires are ever the same. However, there are advantages to planning and preparing the family, ranch, and livestock for these situations. And most importantly, there are valuable lessons from each wildfire that can be applied to the next wildfire. By no means is this a comprehensive list, but it is a starting place to begin processing and preparing living and ranching with wildfire.

To prepare for a wildfire, farmers and ranchers should:

- Know fire history and typical fire behavior of the area.
- Create a livestock relocation/evacuation plan.
- Create defensible space around all structures.
- Clear vegetation around fuel tanks and equipment.
- Create an evacuation plan for all workers and family members.
- Open the gates if able and remove locks.
- Clearly mark roads, water tanks, ponds, and other water supplies available for firefighting efforts. Include maps with GPS information if available.
- Provide a copy of planning information to local fire department before wildfire season.
- Keep veterinary first aid supplies on hand and inventoried before each fire season.
- Train cattle to feed trucks so they can be more easily gathered and moved.
- Have a livestock moving/gathering plan ahead of time with specific direction of animal movement considerations relative to herd/fire location on the ranch.
- Create multi-purpose firebreaks such as roads with hoof action from salt, mineral, cake.
- Prioritize firebreaks around headquarters, houses, barns, and other structures ideally in a looped bladed road.

- Plant food plots or winter forages as green belts to serve as a multi-purpose fire break around structures.
- Consider bladed firebreaks on heavily trafficked county roads, highways, farm-to-market roads to avoid unintended ignitions in pastures.
- Strategically place water lots in pastures for defensible space for livestock.

Resources

- GroupMe: https://groupme.com/
- Ready, Set, Go! https://www.wildlandfirersg.org and https://tfsweb.tamu.edu/ProtectYourCommunity/ and https://www.ready.gov/wildfires
- Firewise USA®: https://www.nfpa.org/en/education-and-research/wildfire/preparing-homes-for-wildfire
- Fire Weather Dashboard: https://www.weather.gov/dlh/fwd
- Texas Interagency Coordination Center: https://ticc.tamu.edu/
- Steffens, T., M. Russell, and K. Radicke. 2018. Wildfire Behavior and Emergency Response ERM-041. Texas A&M AgriLife Extension Service.
- Fire Adapted Communities https://fireadapted.org
- How to prepare for a wildfire www.fema.gov
- Fire Weather Alert System Mobile App (FWAS) (https://research.fs.usda.gov/rmrs/products/sycu/fire-weather-alert-system-mobile-app-fwas-realtime-data-could-save-lives?utm_source=MarketingCloud&utm_medium=email&utm_campaign=SYCU+Funnel+Focal+Analysis&utm_content=Fire+Weather+Alert+System+Mobile+App+(F)
- Wind Ninja (https://research.fs.usda.gov/rmrs/products/dataandtools/tools/windninja?utm_source=MarketingCloud&utm_medium=email&utm_campaign=SYCU+Funnel+Focal+Analysis&utm_content=https%3a%2f%2fresearch.fs.usda.gov%2frmrs%2fproducts%2fdataandtools%2ftools%2fwindninja)
- Watch Duty: https://www.watchduty.org/

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