



SPRING CREEK RANCH

AMANGANI

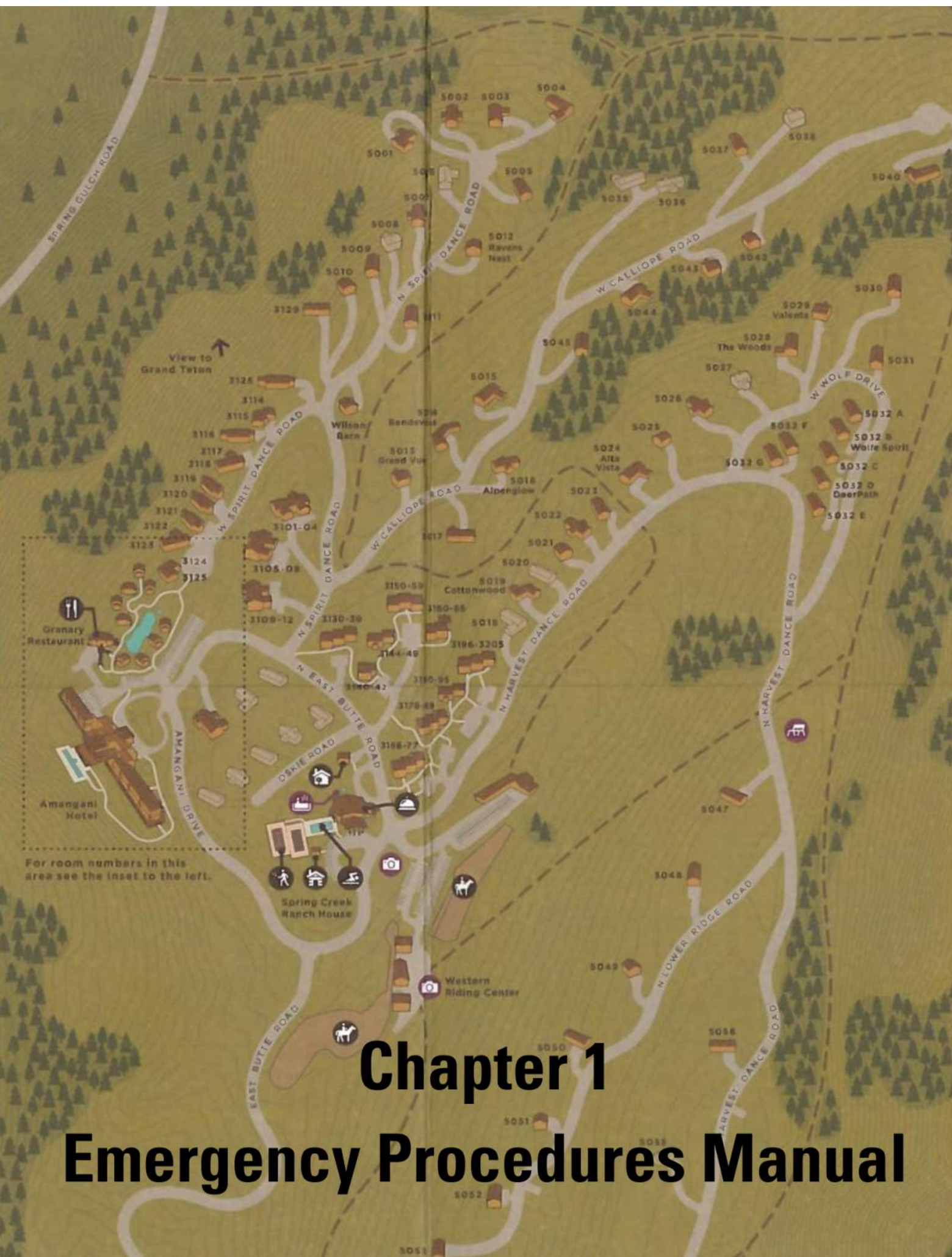
**Wildfire Defense Master Plan  
and  
Emergency Procedures Manual**

**Developed by  
Y2 Consultants, LLC  
2021**

Photo Credit: InciWeb

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# Chapter 1

# Emergency Procedures Manual

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NATURAL RESOURCE SERVICES

## **Prepared for the Board of the Spring Creek Homeowners Association**

**May 2021**

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# INTRODUCTION

Spring Creek Homeowners Association (SCHOA) Board of Directors selected Y2 Consultants, LLC (Y2) to provide recommendations in preparing for, mitigating, and responding to potential natural and human hazard events, particularly wildland fire. This document should serve as an emergency response and evacuation plan for extraordinary emergency situations associated in or affecting SCHOA. The Wildfire Defense Master Plan and Emergency Procedures Manual (EPM) provides recommendations to facilitate an orderly and efficient response to wildland fire and other natural disasters.

This document contains three chapters:

- Chapter 1 – Emergency Procedures Manual
- Chapter 2 – Wildfire Risk Reduction for Structures
- Chapter 3 – Wildfire Risk Reduction for the Open Space

Chapter 1 provides emergency response guidance for any emergency requiring evacuation for Spring Creek and Amangani homeowners and guests.

This EPM has several components. First is a **Determination of Scope**. The overall scope of this plan is wildfire risk management, although other circumstances that may require an evacuation may use these processes.

Second is a **Situation Analysis** which summarizes the implementation status of the 2007 Fuels and Habitat Management Plan and associated wildfire mitigation efforts.

Third is the development of an **Alert and Evacuation System**. This plan identifies the needs and options for alert and evacuation systems.

Fourth is developing an **Organization, Staffing and Training** plan. This plan recommends a dedicated set of SCHOA staff or other assigned individuals to manage and implement evacuation measures.

The last step is the **Maintenance and Execution** of the EPM. Emergency plans are only valuable if maintained, regularly reviewed, and appropriate staff maintain a high level of training. A maintenance schedule is included in this plan to ensure it can be used effectively for any emergency.



## PLAN SCOPE

This document initially focused on wildland fire risks but has been expanded to include other emergency response efforts. Ultimately any situation that may require evacuation may utilize this plan.

## SITUATION ANALYSIS

This situation analysis is focused primarily on wildland fire preparedness.

- SCHOA initiated a wildfire hazard analysis and has hosted meetings with Y2, Jackson Hole Fire/EMS Battalion Chief Mike Moyer, Emergency Management Coordinator for Teton County Rich Ochs, and Teton Conservation District (TCD) staff member Robb Sgroi.
- Open space management recommendations made in 2007 have been partially implemented.
- Fire/EMS recommended a traffic study of SCHOA to determine evacuation efficiency during full occupancy.
  - Not completed
- Fire/EMS recommended an evaluation of the water system to support irrigation and firefighting needs.
  - Not completed



## EMERGENCY ALERT AND EVACUATION SYSTEMS

Amangani has a hardwired telephone system that allows direct communication from the front desk and a reverse 911 call. No emergency alert system exists for the rest of the SCHOA properties.

### EMERGENCY ALERT SYSTEMS

SCHOA may receive alerts of emergencies from various sources, depending on the nature and location of the incident. Jackson Hole Fire/EMS or the Teton County Sheriff's Office make the decision to evacuate an area and send an alert. If an alert is issued, Teton County Emergency Management is responsible for the public alert and warning in Teton County, and they manage Nixle, Emergency Alert System (EAS), Integrated Public Alert & Warning System (IPAWS), Wireless Emergency Alerts (WEA) alerts and county-owned outdoor warning sirens. Weather-related emergency alerts are broadcast by the National Weather Service (NWS).



With no site-specific alert measures in place, Y2 recommends the installation of three sirens on the property. Sirens are good for alerting people in the immediate area of SCHOA of a potential emergency. While they do not easily convey the nature of the immediate threat, they make people aware of an emergency and can be used to indicate when evacuation is suggested regardless of the reason. It may also encourage people to access an auxiliary application such as Nixle to get further information. Sirens should only be used in an emergency that requires evacuation. Three sirens are proposed to cover the property; two on existing pumphouses that have electricity and one on the Ranch House. These locations will cover the entire development (Appendix A). Sirens should be tested at least annually. All homeowners and guests should be notified of the test schedule.

As of fall 2020, the SCHOA Board approved the use of the existing countywide platform of Nixle for emergency communication. Nixle is an open communication platform application that connects public safety, municipalities, schools, businesses, and the communities they serve. Jackson Hole Fire/EMS and the Teton County Sheriff's Office utilize this countywide system. **To sign up for Nixle, text TETON\_WY to 888777.**

Ultimately, Emergency Management and Y2 recommend a property-specific communication plan that includes methods to quickly broadcast information to all property owners and occupants. Some options include AlertMedia, SendWordNow or Rave Alert. These are phone apps that can be made specific to homeowners and guests of SCHOA if they are encouraged to sign up when registering. These can be used in addition to Nixle and provide site specific information to SCHOA instead of a countywide Nixle alert. Success of these is dependent on SCHOA strongly encouraging signing up for these apps as part of hotel/room registration and HOA membership. Signing up cannot be required but should be strongly encouraged.

Y2 recommends that if a site-specific app for emergency communication is selected that it remains dedicated to communication specific to emergency situations.

## ***EVACUATION SYSTEMS***

An evacuation notice is the urgent immediate egress or escape of people away from an area that contains an imminent threat, an ongoing threat or a hazard to lives or property. Based on discussions with Jackson Hole Fire/EMS and SCHOA we recommend adoption of the Ready, Set, Go! Wildfire Action Plan. Ready, Set, Go! commands are sent by Nixle. The plan is provided in Appendix B; an electronic copy is provided in the final packet with this plan, with one modification. At the recommendation of Jackson Hole Fire/EMS, Y2 created a **STAY** level if evacuation becomes impossible for any reason. The single ingress and egress into SCHOA limit safe evacuation opportunities in case of fast-moving fires.

### *EVACUATION LEVELS*

**Level 1: READY** level is a **year-round status**. A **READY** alert is **NEVER ISSUED** by Jackson Hole Fire/EMS. Everyone should be **READY** for evacuation at any time. This requires making basic preparedness measures prior to an emergency situation. Being **READY** includes implementing Firewise principles around your home and always having a Go-Bag ready in case of evacuation. See Appendix C for suggestions for what to keep in your Go-Bag. Homeowners and visitors with special needs, or those with pets should take note and also make preparations for relocating family members and pets.

**Level 2: SET** evacuation level indicates there is a significant risk to your area, and residents and visitors should be ready to leave at a moment's notice. **This may be your only warning. Depending on circumstances, time may not allow for this level to be issued and a GO order may be issued instead.**

**Level 3: GO** means danger is currently affecting your area or is imminent, and you must leave immediately. **This will be your last opportunity to leave the property.**

**Level 4: STAY** means that North East Butte Road has been cut off, or that the best plan of action is to shelter on the property. Remaining residents, guests and personnel should go to the Emergency Gathering Areas at the Ranch House pool and tennis area or Granary parking lot. All vehicles should be left in garages or parked at the Western Riding Center south parking lot to separate people from the risk of exploding cars. Vehicles should not be parked at the Ranch House or Granary parking lots. The Ranch House will serve as the Command Center and will have trained traffic and guest managers in place to assist.



#### *EVACUATION MAP*

Should time allow for evacuation, a proposed evacuation map is provided in Appendix A. A full-size map (24x36) is provided with the paper copy of this plan; smaller maps have been made for distribution and are included in Appendix A. Y2 recommends installation of permanent signage along roads and at intersections to indicate the direction of travel in case of evacuation. Additional signage should be placed at Emergency Gathering Areas, also shown in Appendix A.

## **ORGANIZATION, STAFFING AND TRAINING PLAN**

To effectively implement any sort of emergency management plan, significant effort will need to be focused on staffing and staff training. Successful management of any emergency requires having multiple trained people for each position and regular communication amongst staff to keep emergency procedures fresh. Y2 recommends an incident management structure which will enable SCHOA to successfully coordinate with Jackson Hole Fire/EMS, guests, and homeowners.

### **INCIDENT MANAGEMENT**

Jackson Hole Fire/EMS and/or the Teton County sheriff have the ultimate authority during most incidents. However, SCHOA should appoint at least three individuals to be SCHOA Incident Commanders (ICs) and numerous Incident Managers.

**SCHOA Incident Commander (IC)** – Incident Commanders will receive training from Fire/EMS on how to manage incidents and must be available 24/7/365. ICs will be trained to make critical decisions until Fire/EMS arrives and will maintain consistent communication with Fire/EMS. These individuals will need to coordinate all trainings, deployment of Traffic Managers and inform Guest Managers. Once an alert has been received from Jackson Hole Fire/EMS the IC will initiate the warning systems (sirens, apps) chosen by SCHOA and set up a work area in the business office. The IC will contact other members of the emergency response team that an incident has occurred and provide them with further instructions and update them on Fire/EMS response time.

The IC will lead the efforts to inform the homeowners and visitors of the incident and initiate and communicate the proper Ready, Set, Go! or Stay action. The IC will direct the activities of the staff in a calm and orderly manner until Fire/EMS can assume command. If a Stay order is given it will be the responsibility of the IC to organize staff and SCHOA Incident Managers at the Emergency Gathering Areas to provide information and care as needed. Y2 recommends the ICs organize shifts of responsibility (either daily/weekly/monthly) so that in case of an event, time is not lost determining who is in charge. Shift schedules should be made available to key staff and regularly updated.

**SCHOA Traffic Managers (TM)** – SCHOA will also appoint Traffic Managers that will be available 24/7 from approximately April 1<sup>st</sup> through November 15<sup>th</sup> or until a time when open space fuels are snow covered for the year. Y2 recommends that SCHOA should have six (6) TMs available at any given time. These individuals need to be trained in traffic and crowd control, able to deescalate situations, and be readily available if an incident occurs. These individuals should be in residence or on staff during the height of wildfire season; fewer may be needed when wildfire season is over. Once the evacuation directive has been received from the IC the TMs will go to their assigned Traffic Management Points (shown in Appendix A). TMs will wear high visibility vests and set up barricades to control traffic flow out of the area. If a Stay directive has been given the TMs shall direct people to the Emergency Gathering Areas.

**SCHOA Guest Managers (GM)** – Guest Management personnel will need to be trained to handle the influx of questions and people once an alert (evacuation or Stay) has been issued. SCHOA front desk staff will end up being the de facto information source during an incident. They need to receive direct communication from the IC to manage information flow. These individuals will need to be trained in crowd control and be able to deescalate situations. These may be high turnover positions and may require frequent training sessions from the IC.

GM & TM personnel (including concierges) should be tasked with and trained in shuttling vehicles in case of an evacuation/Stay order. Resort multi-passenger vehicles can be used for guests without cars or with mobility issues, or if they cannot safely retrieve their passenger vehicle.

**SCHOA Stable Manager** - If a pre-evacuation notice is given or if a wildfire is approaching within 2-3 miles, all horses should be preemptively evacuated from SCR via truck and trailer. If time does not allow for evacuation, Y2 recommends corralling them in The Western Riding Center south corral. Management actions are required for this to be feasible and are described in the Open Space Management Plan.

## **PLAN EXECUTION AND MAINTENANCE**

The effectiveness of this plan depends largely upon SCHOA prioritizing the identification of a property-specific emergency communication system, installing signage and sirens, and training staff and homeowner volunteers to manage an emergency. Its effectiveness will be limited if emergency communication systems are not improved and if greenstrips and structural fire mitigation efforts are not fully implemented. To be effective in an emergency situation, the key personnel (Incident Commanders and Guest/Traffic Managers) must be up-to-date on their roles and responsibilities for plan implementation. We recommend incorporation of emergency operation procedures into all staff meetings and that Incident Commanders and Guest/Traffic Managers communicate at least weekly to ensure that roles and responsibilities are understood and can be acted on in case of emergency. This plan should be reviewed for accuracy and adequacy at least annually.

SCHOA should consider stockpiling supplies to support up to a 24-hour Stay order. Supplies to consider include food and water, basic medical supplies, and bedding materials. This should be explored further with the Teton County Emergency Management Coordinator. Y2 recommends NOAA All Hazards Weather Radios at key locations and encourage all residents to have one in their home. These would be activated and send out an alert tone in the event of any emergency, including wildfires. Emergency Management and the NWS both send alerts out over this system.



## RECOMMENDATION SUMMARY

In summary, this plan recommends taking the following actions:

- Complete the installation and maintenance of the greenstrips and other preventive measures recommended in 2007 and updated in 2021.
- Implement a property-specific emergency communication system to effectively communicate with guests and residents.
- Install three emergency sirens on property (two pump houses and the Ranch House).
- Install directional emergency evacuation signage.
- Implement a staffing and training program to train people to assist with an emergency event, including training exercises to ensure readiness.

Implementation of this plan will increase the overall safety for homeowners, guests and employees of Spring Creek Ranch and Amangani.



2019 Wildlife Museum Fire. Photo Credit: See JH20.

# Appendix A: EVACUATION MAP







## **Appendix B. READY SET GO!**

# READY, SET, GO!

**Sign up for Nixle local emergency alerts by visiting [Nixle.com](https://www.nixle.com) or by texting TETON\_WY to 888777, for Spanish reply back with ESP**

## READY

- We are always in *Ready*, preparing for evacuations and becoming fire-adapted.
- Sign up for Nixle (see above)
- Create a Wildland Fire Action Guide that includes evacuation planning for your home, family and pets.
- Assemble an Emergency Supply Kit for each person in your household.
- Create a document with important evacuation and contact information.
- Follow these websites : [TCincident.org](https://www.tcincident.org), [Tetonfires.com](https://www.tetonfires.com) and [inciweb@nwcg.gov](mailto:inciweb@nwcg.gov).
- Gather important financial, personal, household, and medical information in one place.

## SET

- Be Alert - Be Weather/Lightning & Fire Aware - YOU MAY NOT GET A SET ALERT!
- Have a heightened awareness of fire potential during Red Flag Warnings.
- Prepare to evacuate. Remain close to your house, keep an eye on your family and pets.
- Consider evacuation if you have pets or if anyone may require extra time or has mobility issues.
- IF YOU FEEL YOUR LIFE IS IN DANGER - LEAVE! Don't wait. Notifications may not get to everyone.
- Alert family, neighbors and elderly, while staying updated on shelters, roads, weather & fire.
- Make preparations of your home and property if you have time (close doors, turn off electricity, etc.).

## GO!

- Act Early - EVACUATE!
- By leaving early you give your family the best chance of surviving a wildfire. You also help firefighters by keeping roads clear.

OR  
(depending  
on  
evacuation  
order)

## STAY!

- Shelter on property at the Ranch Office or the Granary parking lot.
- Vehicles should be left in garages or moved to the south parking lot at the Western Riding Center.



## **Appendix C. RECOMMENDED GO-BAG CONTENTS**

# GO-BAG ESSENTIALS

**THE BAG: Choose a sturdy, easy-to-carry container (i.e., a backpack, duffel bag or wheeled suitcase) that is large enough to hold all listed items. For large families, more than one bag may be needed. Each bag should be clearly labeled.**

- Photocopies (not originals) of your important documents (reference cards, insurance cards, birth certificates, deeds, photo IDs, proof of address, etc.) in a waterproof and portable container. These can also be kept in the cloud.
- One change of clothing and personal toiletries for everyone in your party. Travel size containers are recommended and should be replaced annually.
  - Washcloth
  - Towel
  - Soap
  - Lotion
  - Toothpaste and toothbrush
  - Dental floss
  - Shampoo
  - Contact lens solution and spare contact lenses or glasses
  - Deodorant
  - Comb or brush
  - Razor and shaving cream
  - Mirror
  - Feminine supplies
  - Lip balm
  - Sunscreen
- Inventory of home contents and photographs or videos of the major items, the house, and landscaping. Contact your insurance agent for an inventory checklist. These can be kept in the cloud.
- Extra keys (car and house), and the garage door opener. Check batteries on electronic remotes.
- Cell phone charger and a battery pack.
- Contact information for family, friends and physicians.
- Credit/Debit and ATM cards or cash (at least \$50-100 in small denominations).
- Bottled water and non-perishable food, such as energy or granola bars.
- Medications and other essential personal items, including your doctor's name and phone number. Be sure to refill medications before they expire. Include a list of medications, why you take them, and their dosage.
- First aid kit.
- Childcare supplies.
- Pet supplies (medications, leashes, vaccination records, food).
- If space allows - small irreplaceable items such as external hard drives, books or games, pet carriers, etc.



# **Chapter 2**

## **Wildfire Risk Reduction for Structures**

Photo Credit: Shutterstock.

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## INTRODUCTION

In 2007, a Fuels and Habitat Management Plan for Spring Creek Ranch (SCR) open space was completed by Teton Science Schools. Focused primarily on vegetation management, it provided limited recommendations for improving fire resistance of individual properties within SCR. Y2 Consultants, LLC (Y2) was selected by the Spring Creek Homeowners Association (SCHOA) Directors to update the 2007 plan and provide expanded recommendations specifically for structures to improve fire resistance. This is the second chapter of the SCHOA Wildfire Management Plan.

## UNDERSTANDING WILDFIRE RISKS AT SPRING CREEK RANCH AND AMANGANI

To effectively prepare for wildfire, wildfire behavior must be understood. The Open Space Management Plan (Chapter 3) addresses risks from flammable vegetation away from the structures of SCR. This chapter focuses on other factors that put homes at risk, including the choice of building materials and home maintenance. Using this plan in addition to the other two can serve as a foundation to educate SCHOA members on the risk of wildfire in the Wildland/Urban Interface (WUI) they have chosen to live in. This educational effort should be coordinated with Jackson Hole Fire/EMS and serve to help the members not only to understand their risks but to understand the management efforts SCHOA is enacting to increase SCHOA member and guest safety on the property.



*Demonstration of an ember shower igniting a structure.  
Photo Credit: IBHS Research Facility.*

The goal of this plan is to reduce home ignition potential, allowing fire protection resources to be used as effectively as possible. Actions taken by SCHOA and its homeowners play a significant role in the survival of



*Embers falling through a deck. Photo Credit: IBHS Research Facility.*

structures in a wildfire. There are proven methods for homeowners to prepare their homes to withstand the threat of wildfire. By limiting the amount of flammable vegetation close to the structure, choosing fire-resistant building materials, and performing regular exterior maintenance, homeowners can prepare their home to withstand embers and minimize the likelihood of flames or surface fire touching the home.

SCHOA currently faces fire risks to structures from many sources:

- Some of SCHOAs Codes, Covenants and Restrictions (CCRs) do not accommodate or encourage the use of fire-resistant building or landscaping materials;
- Structures have cedar shake roofs in poor or declining condition; shake roofs are not recommended even if regularly treated for fire resistance;
- Some green roofs are not kept green and are accumulating dry fuels, often next to wood siding;
- Wood siding generally does not meet standards for ignition-resistant materials and some siding is poorly maintained and in contact with ground fuels;
- Structures have tall, highly flammable fuels, such as sagebrush, basin wildrye or conifers, adjacent to or touching the structures;
- Many decks and railings are wood and directly attach to structures and are in deteriorating conditions;
- Despite existing SCHOA directives, decks have firewood and other flammable materials stacked on or below them; and
- Existing greenstrips have not been installed as prescribed or adequately maintained when installed.

## RELATIONSHIP OF STRUCTURES TO OPEN SPACE

Homes ignite in one of three ways – direct flame contact (conduction), embers or firebrands (convection), or radiant heat exposure. Embers provide the most likely risk to structures in SCHOA. The Open Space Wildfire Management Plan provides direction to reduce the risk of direct flame contact and to reduce embers by removing highly flammable vegetation such as sagebrush and maintaining low-flame height producing plant communities in greenstrips. The risk of structure fires can be managed partially by choosing fire-resistant or fire-retardant building materials. Additional home and property maintenance can further reduce the risk of structure fires in SCHOA.

## FINDINGS AND RECOMMENDATIONS

The National Fire Prevention Association (NFPA) and Firewise USA offer useful information on the Home Ignition Zone (HIZ). The HIZ is divided into three zones: Immediate, Intermediate and Extended. Y2 has provided recommendations based on best available science specific to SCHOA; the general recommendations from NFPA are provided in Appendix A.



*Wildfire ember shower. Photo credit: Josh Edelson.*

## STRUCTURES AND MATERIALS

NFPA defines the Immediate home ignition zone as the structure itself and out to 5 feet from the furthest attached exterior point of the home. This section addresses the home itself.

### ROOFING AND CHIMNEYS

There are many opportunities to reduce the risk of structure ignition, even in high risk areas. Construction materials, including roof coverings, should be selected to resist ignition and fire spread. Roof coverings are rated as Class A,

B, C or unrated and can be classified by composition or assembly. Roof coverings that can be rated as Class A by assembly include aluminum and some fire-retardant wood shake products. Roof coverings such as asphalt fiberglass composition shingles, concrete and flat- or barrel-shaped tiles are rated Class A. See Appendix B for more details. Metal roof coverings (steel, copper shingles or sheets, metal sheets or shingles) are also considered Class A if the materials used between the roof covering and sheathing are non-combustible.



Figure 1. Cedar shake roof in disrepair. Note litter (needles and leaves) collected on the right side of the photo.

Many roofs in the development are wooden shake shingle. This type of roofing may trap or accumulate embers resulting in the ignition of the roof. Even treated cedar shake shingles are not recommended by Jackson Hole Fire/EMS. Shake roofs can spread fire down the structure to wooden siding and decking.

While some of the shake roofs are in good condition, many have missing,

loose, or cupped shingles. Some have an accumulation of leaf litter and need cleaning and repair (Figure 1).

Chimneys and stovepipes should be covered with a non-combustible wire mesh screen with openings no larger than 1/2-inch. Be sure all tree branches are trimmed back a minimum of 10 feet from chimneys. Chases should be made of non-combustible materials and have a metal cap.

Some homeowners have installed green roofs. If kept irrigated and are green, these roofs have a low potential for ignition by embers. However, some green roofs are not being maintained and represent a significant ignition potential to the home (Figure 2). Green roofs should be irrigated and have dead vegetation removed on a regular basis to maintain fire safety. Green roof vegetation should not be in contact with any flammable surface such as wood siding, eaves or roof overhangs. The Homes at Amangani Supplementary Design Guidelines (June 2000) allow flat sod roofs with irrigation; these are appropriate if vegetation is kept irrigated and away from wood siding on multi-level roofs.



Figure 2. Green roof in need of maintenance or repair.

A fire-resistant roof is only the first step in making a fire-resistant home. Roof coverings can have gaps between the roof covering and sheathing, generally at the edge or ridge of roofs, or where chimneys or changes in roof elevation occur. These openings allow for everything from birds (Figure 3) bats and other animals to enter and larger gaps will accumulate wind-blown debris.

It is critical to regularly inspect and clean out any areas where debris can accumulate. Annual inspection is recommended as a minimum.

Debris must be removed from gutters regularly, particularly if limbs overhang the roof. We recommend non-corrosive metal screening on



gutters to avoid the accumulation of litter in them. Replace vinyl or wood gutters with metal gutters.

Attics, crawlspaces, soffits, and eaves all provide entry points for debris, and therefore for embers and flames. All vents should be covered with a noncombustible, corrosion-resistant 1/8-inch metal mesh screen. Vents and screens should be checked regularly for tears, corrosion, and debris buildup.

Eaves should all be tightly boxed in, even on decks, and maintained. Soffit vents, attic vents and cold roof vents should be covered with 1/8-inch non-corrosive metal screen.



Figure 3. Bird nest under eaves.

We recommend the SCHOA design guidelines prohibit the use of materials that are Class A by assembly and allow only constructed Class A materials for roofs. See Appendix B for more details.

## **SIDING, WINDOWS, EXTERIOR DOORS, DECKS AND FOUNDATIONS**

Most structures in SCR have wood siding. Generally, the wood siding attaches to wooden decks and roof eaves. Evidence of wood siding in poor repair was seen throughout the development. As with the eaves and soffits, cracked or broken siding creates places for animals or wind to stockpile fine flammable fuels.



Figure 4. Wood siding in poor condition with firewood stacked against the siding.

### **SIDING**

Wood siding is not recommended. If wood siding is selected it should be tight and/or beveled to avoid collecting embers. Siding must be regularly maintained to avoid areas of separation and animal damage where embers could enter and ignite (Figure 4). If used, wood siding should not be in contact with any vegetation and preferably at least three times the height above adjacent vegetation. Any area of wood siding where embers could land and accumulate should have metal flashing. Full logs offer more fire resistance over wood siding if wood is preferred. Any gaps in siding or logs should be caulked or chinked annually. We recommend an ignition resistant or non-combustible siding be selected instead of wood when remodeling, retrofitting, or modifying.

### **WINDOWS**

Windows can create vulnerability for structures in wildfire events. Many windows in SCR were observed to be regular multi-pane windows. These windows offer more thermal protection than single-pane windows. However, best practice for windows in areas of high wildfire risk are to install dual-pane, tempered glass. Tempered glass is approximately 4-times more resistant to breaking during wildfire when windows are closed. Fine mesh (1/16<sup>th</sup>-inch) non-corrosive metal window external screens can improve window fire resistance performance.



## **EXTERIOR DOORS**

Exterior doors should be metal or fiber-cement core. Solid core wood doors offer approximately 20 minutes of protection; metal or fiber cement core doors can withstand fire for longer periods. Garage doors should be tightly fitted (check the gaskets all around the doors) and ideally made of metal panels for the greatest level of fire protection.



Figure 5. Concrete foundation where siding deteriorated, allowing debris to accumulate and where embers could blow in. The deck should be screened to prevent buildup of flammable materials.

## **DECKS**

Decks should be constructed of fire resistant, non-combustible materials without gaps. Areas underneath decking should be kept clean and screened with metal screening to avoid materials collecting under them (Figure 5). Decks should be kept clear of firewood and other combustibles such as fiber doormats and deck furniture cushions. Railings should also be non-combustible (i.e., braided steel).

Y2 observed many woodpiles in contact with the structures and on or under wooden decks (Figure 4). This is an extremely dangerous practice. Woodpiles should not be stored within 30 feet of any building. Y2 observed improper disposal of partially burned firewood and hot ashes into unsafe bins. We recommend a policy be enacted by SCHOA for rental units that only trained

cleaning staff dispose of burnt firewood and ash from fireplaces. Ash cans should be placed well away from buildings and made of concrete.

## **FOUNDATIONS**

Foundations and the connections between the foundation and siding can be made fire-resistant. Most of the foundations observed in SCR are concrete, which is non-combustible. Any vents into crawlspaces should be screened as described above. Siding should be inspected for gaps above the foundation (Figure 5) potentially caused by snow, sprinklers, or age.

## **LANDSCAPING**

Landscaping includes the Intermediate (5-30 feet) and Extended (30-100+ feet) Home Ignition Zones.

Most properties at SCR are irrigated and landscaped. However, not all landscaping is properly designed or maintained for maximum fire resistance.

In some cases, unirrigated native vegetation encroaches up to the structure (Figure 6). This, compounded by steep slopes, puts these structures at high risk. Best practice is to have either no vegetation in the 0-5 feet zone, or to have irrigated, mowed lawn. Under no circumstance should the landscaping touch the combustible siding



Figure 6. Highly flammable native vegetation touching wood siding.

of any structure or achieve flame lengths that could reach the siding (Figure 6).



Figure 7. Vegetation touching wood siding.

Conifers (spruce, fir trees) provide year-round privacy. However, even if they are irrigated and limbed to 10 feet off the ground their canopy should not be within 10 feet of a structure.

If conifers are within 30 feet of the structure, they should have a minimum of 18 feet between canopies and be limbed up.

Thirty to sixty feet away from the structure tree canopies should have 12-foot spacings. Deciduous trees such as aspen, willows and maples can usually remain closer together in these zones due to their high moisture content and lower volatile oil contents.

Examples of landscaping not meeting Firewise guidelines are provided in Figure 8.








	
<p>Example of slope and native vegetation encroachment next to structure.</p>	<p>Example of slope and native vegetation encroachment next to structure.</p>
	
<p>Conifers, though limbed up, are too close together and too close to structure in the Immediate Zone.</p>	<p>Limbed up conifer almost touching the structure.</p>
	
<p>Most of these conifers are in the 30 to 60-foot zone, are too close together, and are not limbed up.</p>	

Figure 8. Examples of landscaping not meeting Firewise guidelines.

## TETON COUNTY WILDFIRE RISK OVERVIEW PROGRAM

Teton Conservation District (TCD) has been conducting free, voluntary Wildfire Risk Overviews for private lands within SCR and on structures where SCR is responsible for maintenance of the exteriors. Through the Wildfire Risk Reduction Program, TCD helps landowners understand and reduce fire risk around residential and commercial structures, and undeveloped areas with an approved building permit. This program provides a free Wildfire Risk Overview, including an in-person home evaluation and a written assessment of risk to the structure and the surrounding Home Ignition Zone. Requesting an overview through TCD provides the landowner an opportunity to apply for cost share monies from TCD following the overview. SCHOA encourages all landowners to consider taking advantage of these services and requesting an overview at <https://www.tetonconservation.org/wildfire-risk-reduction-request-for-wildfire-risk-overview>.

The overviews evaluate:

- Position of the structure relative to fire behavior
- Type of construction
- Roof type and condition, including vegetation buildup
- Documentation of attic, soffit, and crawl space vents
- Review of roof eaves
- Type of windows (single, multi-paned, tempered glass)
- Screen presence and material
- Wall and deck material type
- Fences and other potentially combustible material
- Foundation condition
- Other potential hazards (firewood, propane tanks, vehicles)
- Vegetation assessment
  - Tree type and spacing
  - Identification of high flammability plants
  - Distance of landscaping to structure(s) and distance of branches and limbs to structure and chimney
  - Dead and downed vegetation, and ladder fuels

The site inspection results in a list of recommendations for the landowner to make the property less susceptible to wildland fire impacts.

Site inspections were completed in 2019 and 2020 for SCHOA buildings including the Ranch House and Western Riding Center reception and barn; some recommendations from these site inspections are included in the reports. The SCR administration has copies of completed overview reports and they can be used to help guide steps in wildfire risk reduction for all properties.

The US Forest Service completed a Rapid Assessment of structures and landscaping on properties at SCHOA; their recommendations are included in this report.

## **SPRING CREEK CODES, COVENANTS AND RESTRICTIONS (CCRs), SCR ARCHITECTURAL CONTROL AND DESIGN GUIDELINES, AND THE HOMES AT AMANGANI SUPPLEMENTARY DESIGN GUIDELINES**

The recorded Codes, Covenants and Restrictions (CCRs) for Spring Creek Ranch provide a general plan for development of the entire ranch. Development within SCR requires approval of the SCR Architectural Control and Design Committee, including The Homes at Amangani Supplementary Design Guidelines, approved by the SCR Architectural Committee, are also in place.

Most of the issues identified for wildfire risk in the development are a byproduct of the existing design guidelines for Spring Creek Ranch and The Homes at Amangani. We recommend revision of architectural guidelines to incorporate Firewise principles.



Recommendations include:

- Eliminate the use of cedar shingles in new construction in the Wildland Urban Interface per Teton County Ordinance (February 2021);
- Recommend Class A fire rated roofing products over materials rated Class A by assembly;
- Create a homeowner education program lead by a trained Firewise Ambassador to work with homeowners to implement Firewise guidance (Appendix C) throughout Spring Creek Ranch;
  - Create a “welcoming committee” or similar concept for homeowner collaboration and education
  - Recommend placing this video on the Spring Creek Ranch website  
<https://www.youtube.com/watch?v=pfbEcMeYFFA#action=share>
  - Annually invite a specialist from the Teton Area Wildfire Protection Coalition (TAWPC), Fire/EMS or TCD to a HOA meeting to provide education materials and host a summer fire information walk to inform homeowners and guests about fire management efforts;
- Adopt the Firewise guidelines provided in Appendix C for new construction and landscaping, including minimizing vegetation within 5-feet of a structure;
- For existing buildings, require construction and landscape updating based on Firewise guidelines as buildings are remodeled or modified including roofing, siding, decks and rails, windows, and landscaping; and
- Require all homeowners to request TCD’s free Teton County Wildfire Risk Overview program and to implement the recommended guidelines as soon as possible
  - Landscape management should be in accordance with Firewise guidance in implementing recommendations.

### **SPRING CREEK RANCH CCR RECOMMENDATIONS**

- Article VI, Use Restrictions section A.4 should be revised to allow removal of natural vegetation for approved wildfire mitigation activities. Section A.9 should be revised to incorporate Firewise principles in planting planning.

### **SCR ARCHITECTURAL CONTROL AND DESIGN GUIDELINES RECOMMENDATIONS**

Section 4.2, Architectural Design Scope and Application contains specific language regarding building materials. We recommend the following changes based on Firewise principles:

- 4.2.2. Exterior Materials, Textures and Colors.
  - Minimize use of natural wood materials including shingles for exterior applications. Use materials with Class A fire rating (by right, not by assembly or treatment).
- 4.3.2. Building Standards and Location
  - Landscaping should be consistent with Firewise guidelines including the distance from structures to plant materials
- 4.4.3. Plant Materials
  - Update plan materials list to be consistent with Firewise guidelines for location of plant materials with higher flammability (i.e., sagebrush, conifers)

### **THE HOMES AT AMANGANI SUPPLEMENTARY DESIGN GUIDELINES**

- Update where appropriate to be consistent with SCR CCRs and Architectural Guidelines.

## ADDITIONAL RESOURCES

The [National Fire Protection Association \(NFPA\)](#) provides extensive resources for public education regarding fire and wildfire. The [Firewise USA](#) program is a program managed by NFPA and focuses on wildfire resources. Information on both programs can be found at [NFPA.ORG](#). Further information on preparing your home for wildfire can be found at the University of California Cooperative Extension – [Fire In California](#).

# **Appendix A: WILDFIRE RESEARCH FACT SHEET: ROOFING MATERIALS**

# Roofing Materials:

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## WILDFIRE RESEARCH FACT SHEET

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## Roofs are a highly vulnerable part of a home during wildfires

**HOMEOWNERS NEED TO IMPLEMENT RISK REDUCTION ACTIONS THAT MAKE HOMES BETTER ABLE TO SURVIVE A WILDFIRE - AND THE ROOF IS A GREAT PLACE TO BEGIN!**

### HOW HOMES IGNITE

Homes ignite in one of three ways: embers/firebrands, radiant heat exposure or direct flame contact. An example of an ember ignition is when wind-blown embers accumulate on combustible materials such as a wood shake roof. An untreated wood shake or shingle roof covering is the greatest threat to a home.

### ROOF COVERINGS AND ASSEMBLIES

Roof covering fire ratings are Class A, B, C, or unrated; with Class A providing the best performance. Common Class A roof coverings include asphalt fiberglass composition shingles, concrete and flat/barrel-shaped tiles. Some materials have a "by assembly" Class A fire rating which means, additional materials must be used between the roof covering and sheathing to attain that rating. Examples of roof coverings with a "by assembly" fire rating include aluminum, recycled plastic and rubber and some fire-retardant wood shake products. If a wood shake roof does not have the manufacturer's documentation specifying the fire retardant, assume it's untreated.

### TILE AND ROOF COVERINGS WITH GAPS BETWEEN THE COVERING AND ROOF DECK

Flat and barrel-shaped tiles, metal, and cement roof coverings can have gaps between the roof covering and sheathing, which typically occur at the ridge and edge of roofs. These openings can allow birds and rodents to build nests with materials that are easily ignited by embers. Flames from this type of ignited debris can spread to the structural support members, bypassing the protection offered by a Class A rated roof covering. Plugging these openings between the roof covering and the roof deck, is commonly called "bird stopping". Regularly inspect and maintain these areas.

### DEBRIS ACCUMULATION – ROOF AND GUTTERS

Wind-blown debris (including leaves and pine needles from nearby and overhanging trees) will accumulate on roofs and in gutters. Dry debris can be ignited by wind-blown embers. These flames can extend to the edge of the roof and adjacent siding. Even with Class A fire-rated roof coverings, vertical surfaces next to the roof edge will be exposed to flames from the ignited debris. Regularly remove vegetative debris from your roof and gutters.

### ATTICS, CRAWLSPACES, SOFFITS AND EAVES

Post-fire research has shown attic vents, roof and gable end vents and under-eave areas are entry points for embers and flames. Reduce the size and number of embers that pass through vents into attic and crawlspaces by covering them with a 1/8-inch metal mesh screen. When wildfires threaten, vents can be covered with 1/2-inch or thinner plywood, or a thin metal plate. Ensure these are removed when the threat has passed.

## REDUCE YOUR ROOF'S VULNERABILITY TO WILDFIRE

**1** Roofs should be Class A fire-rated, such as asphalt composition shingles. If you're unsure about your roof's rating, hire a professional roofer to make a determination.

**2** Remove debris on the roof and in the gutters at least twice a year, or more often if necessary.

**3** Remove tree branches that overhang the roof.

**4** Periodically inspect exposed areas under eaves and soffits to ensure construction materials are in good condition.

**5** Cover vents, e.g., with noncombustible, corrosion-resistant 1/8-inch metal mesh screens.

**6** Inspect and maintain your roof on a regular basis. Replace when necessary.



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## **Appendix B: NATIONAL FIRE PREVENTION ASSOCIATION CHECKLIST AND HOME IGNITION ZONE (HIZ) INFORMATION**

# HOME IGNITION ZONE CHECKLIST

## SIMPLE STEPS FROM ROOF TO FOUNDATION TO MAKE A HOME SAFER FROM EMBERS AND RADIANT HEAT

- ☐ Clean roofs and gutters of dead leaves, debris and pine needles that could catch embers
- ☐ Replace or repair any loose or missing shingles or roof tiles to prevent ember penetration
- ☐ Reduce embers that could pass through vents in the eaves by installing 1/8 inch metal mesh screening
- ☐ Clean debris from exterior attic vents and install 1/8 inch metal mesh screening to reduce embers
- ☐ Repair or replace damaged or loose window screens and any broken windows
- ☐ Screen or box-in areas below patios and decks with wire mesh to prevent debris and combustible materials from accumulating
- ☐ Move any flammable material away from wall exteriors - mulch, flammable plants, leaves and needles, firewood piles - anything that can burn
- ☐ Remove anything stored underneath decks or porches

**VISIT [FIREWISE.ORG](https://www.firewise.org) FOR MORE DETAILS**

Image by NFPA, with funding from USDA Forest Service

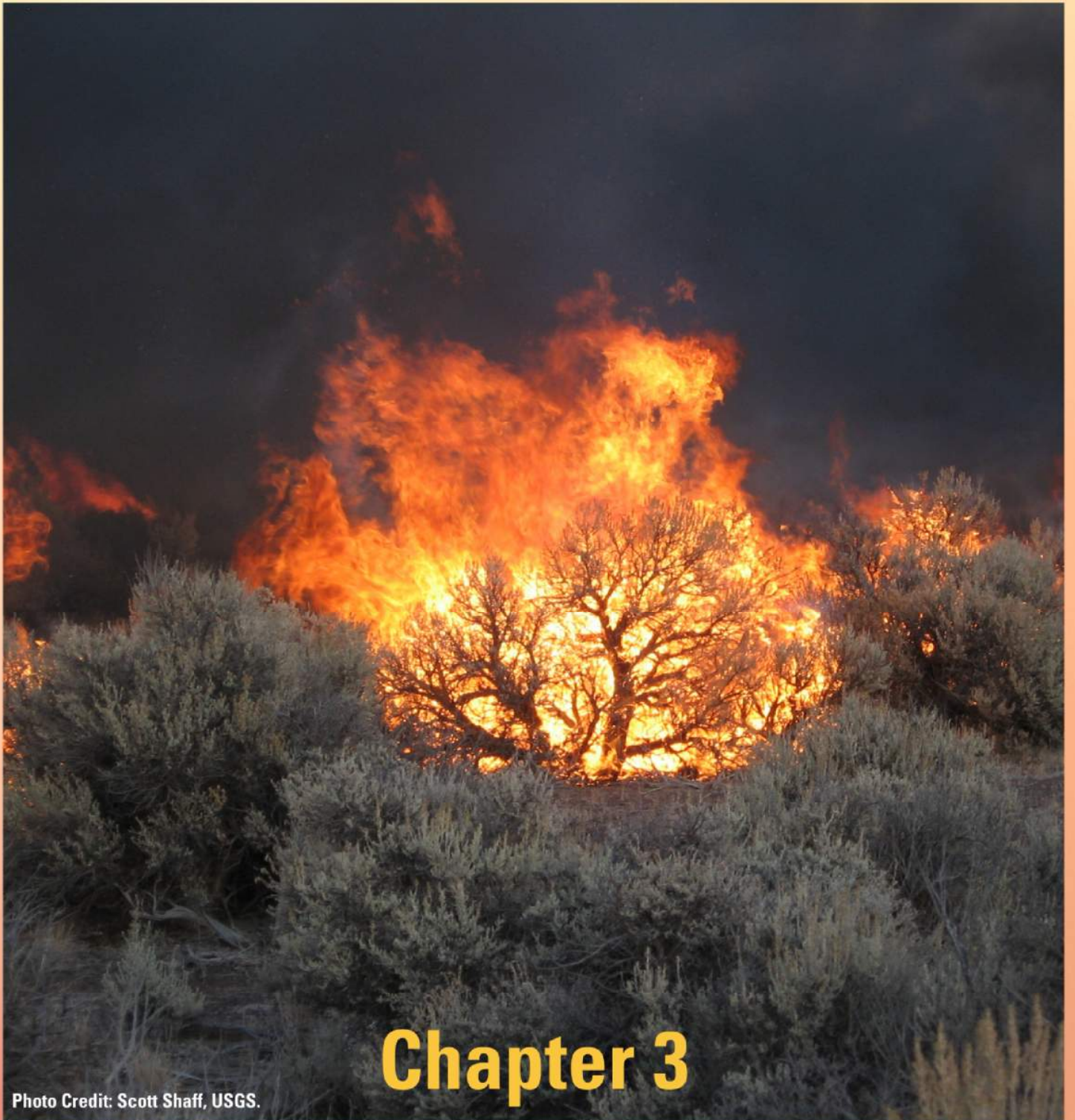


Photo Credit: Scott Shaff, USGS.

## Chapter 3

# Wildfire Risk Reduction for the Open Space

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## INTRODUCTION

This document is the third and final chapter of the Spring Creek Homeowners Association Wildfire Defense Master Plan and Emergency Procedures Manual.

In 2007, a Fuels and Habitat Management Plan for Spring Creek Ranch (SCR) open space was completed by Teton Science Schools. It defined fuels management as the manipulation of plants and litter (dead, down plant material) to reduce the risk of, frequency, rate of spread, and size of wildland fire. Fuels management is a proactive approach to reducing wildfires and their intensities (as opposed to the reactive approach of fire management and suppression). A realistic objective for fuels management is to reduce flame height and reduce the likelihood of a crown (canopy) fire. Fuels management will not guarantee the elimination of wildland fire.

Y2 Consultants, LLC (Y2) was selected by the Spring Creek Homeowners Association (SCHOA) Directors to update the 2007 plan. This 2021 update summarizes the proposed 2007 work that has been completed to-date and provides additional recommendations for fuels mitigation efforts.

The Jackson Hole Land Trust and Teton County Scenic Preserve Trust hold conservation easements within SCR. The Jackson Hole Land Trust owns approximately 338 acres of property adjacent to the subdivision. The property contains significant scenic, natural, wildlife and wildlife habitat values.

The subdivision is located in the wildland-urban interface (WUI). Fuel loads on the surrounding properties and within the subdivision have changed little since the 2007 plan. High fuel loads (forested areas and sagebrush communities) remain in the areas surrounding the subdivision. Extensive construction has occurred in Spring Creek Ranch and The Homes at Amangani since the 2007 plan.

The actions proposed in this plan have been reviewed by the Jackson Hole Land Trust, Teton County Scenic Preserve Trust, Jackson Hole Fire/EMS, Teton Conservation District, and Teton County Emergency Management and their comments were incorporated into the final plan.

## STATUS OF 2007 PLAN IMPLEMENTATION



Figure 1. Greenstrip 1 looking north, August 2020

The 2007 plan was designed to create a loop of greenstrips around the SCR open space with an emphasis on the west (Figure 1) and southwest boundaries due to prevailing wind direction and increased ignition sources. Four greenstrips of varying widths were proposed on the property (Figure 2). Initial recommendations to the SCHOA included significantly wider greenstrip widths than were ultimately approved and anticipated some additional fuels mitigation work would be completed on private parcels adjoining the greenstrips. Below is a summary of the status of the approved widths for each open space greenstrip since 2007.

- Greenstrip 1A – Installed, needs to be maintained and widened
- Greenstrip 1B – Installed, needs to be maintained and widened
- Greenstrip 2 – Partially installed
- Greenstrip 3A – Not installed
- Greenstrip 3B – Installed, needs to be maintained
- Greenstrip 3C – Installed, needs to be maintained
- Greenstrip 4 – Not installed
- Implement “Firewise” guidelines on privately held lands for structures and landscaping/vegetation – Partially implemented
  - See the Chapters 2 and 3 for more details.

Generally speaking, greenstrips 1 and 3 (west and east side of SCR, respectively) were completed to the minimum-recommended widths. Greenstrip 1 should be expanded in width. Greenstrip 2 was partially completed; some deadwood removal was completed adjacent to the existing two-track. Greenstrip 4 has not been completed, although the East North Butte Road section is tentatively scheduled for installation in the spring of 2021. Appendix A provides detailed notes regarding implementation status.



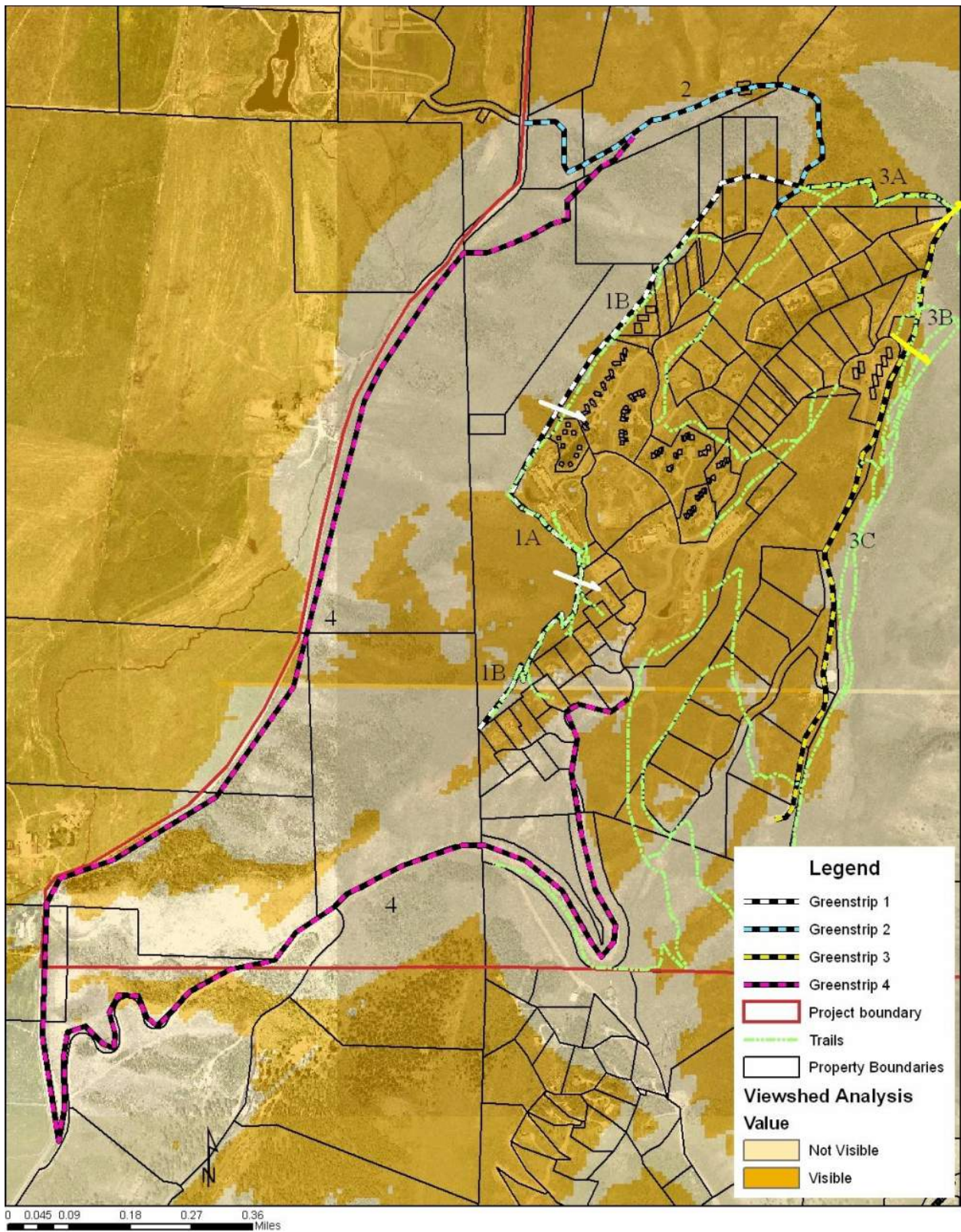


Figure 2. 2007 proposed greenstrips.

## NEED FOR TREATMENT

Devastating fires in the wildland urban interface (WUI) are now common occurrences. Brush, grass and forest fires account for almost one-quarter (23%) of fires handled by local (municipal or county) fire departments (Ahrens 2018). The National Fire Prevention Association (NFPA) provides these statistics on wildland fire (Ahrens 2018):

- Local fire departments responded to an estimated average of 306,000 brush, grass, and forest fires in the U.S. per year in 2011-2015, an average of 840 per day.
- During 2011-2015, heavy or light vegetation was the item first ignited in an average of 6,200 reported home structure fires per year. These fires caused an average of seven civilian deaths, 53 civilian injuries, and \$130 million in direct property damage.
- In 2011-2015, brush, grass and forest fires caused an average of 1,330 fireground injuries to firefighters from local fire departments. Five percent of total firefighter fireground injuries from local fire departments occurred at these incidents. Volunteer firefighters accounted for a disproportionate share of these injuries.
- The vast majority of brush, grass and forest fires in 2011-2015 were caused by human activities. Leading causes include intentional fire setting, open burning of waste, smoking materials, and electrical power or utility lines.
- From 2007-2016, a total of 44 local firefighters, or an average of four per year, were fatally injured as a result of brush, grass or forest fires or prescribed fires. Just over half of the deaths (25) in total occurred while fighting the fires and the others occurred while firefighters were responding to the incidents or returning back to the station.
- The EPA finds that Wyoming's climate is changing, and the associated higher temperatures and drought are likely to increase the severity, frequency and extent of wildfires in Wyoming (EPA 430-F-16-052, 2016).

The vegetation surrounding and within SCHOA is highly flammable and has elevated levels of human activity. The open space provides important habitat for wildlife and recreational opportunities for homeowners and guests of SCHOA. Recent fires (the Saddle Butte and Museum fires in 2019 and the Swinging Bridge fire in 2020) show the speed at which fires spread in these very flammable plant communities. Fuels mitigation is critical for safety of residents and guests of SCR and Amangani. Y2 recommends the SCHOA continue to educate members on the importance of implementing and maintaining open space recommendations.





Figure 3. Sagebrush stand pre-burn (top) and during a prescribed burn (bottom). Photo Credit: Blue Valley Ranch.

The primary plant communities in SCR are conifer-encroached aspen and sagebrush-dominated communities. Each fuel type burns with different intensity. Sagebrush and conifers are very flammable. Sagebrush can produce flames in excess of 30 feet under dry conditions. Grasses generally produce flames approximately 1.5 times their height. Conifers can produce flames of 100 to 350 feet in dry, windy conditions. Deciduous trees such as aspen are difficult to ignite. The moisture in the bark of the aspen greatly decreases the chance of aspen igniting, and the leaves in mature aspen trees are too far off the ground to be ignited by ladder fuels.

In addition to the direct risk to SCR from wildfire, fires also produce embers. 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. Embers create significant risk for additional vegetation fires and structure fires.

## OPEN SPACE MANAGEMENT RECOMMENDATIONS

These recommendations are provided to create the safest possible environment for the homeowners and guests of SCHOA. The highest threats of fire at Spring Creek Ranch, Amangani, the Granary and SCR hotel are from the south and west side of the property. Risk from fires from the north and east are considered moderate (Teton County Fire Evacuation Plan 2006).



Figure 4. Embers from wildfire. Photo Credit: Noah Berger, AP.

## GREENSTRIP 1

Greenstrip 1 is established but is very narrow and has not been mowed annually. At the time of the August 2020 site visit the greenstrip was cured grass 12-18 inches tall. Without being mowed, this connects the fuels lower on the Spring Gulch Road side with the fuels adjacent to the occupied lots in the subdivision.

At a minimum, the existing greenstrip should be mowed annually. We recommend expansion of the greenstrip to at least double its current width; ideally the greenstrip would be at least 30 feet wide. As it is currently configured, the sagebrush downhill from the greenstrip could provide flame lengths of 9-15 feet if burned, creating an opportunity for a fire to jump the greenstrip.

An irrigation system runs along at least a portion of this greenstrip. The system should be evaluated for functionality as soon as possible and any necessary repairs made. The system should be inspected and maintained annually.



Figure 5. Irrigated lawn between the greenstrip and the residence.

On private lands adjacent to the open space, it is advisable to further reduce the risk of fire that sagebrush and basin wildrye should be removed and replaced with short stature native grasses that could be irrigated and mowed. Conifers, such as those shown in Figure 6, will provide flame heights in excess of 200 feet and would throw burning embers well beyond the boundaries of Spring Creek Ranch. In chokecherry and aspen stands, deadwood and ladder fuels should be removed from approximately 15 feet downslope of the trail.

Figure 6. Greenstrip 1 looking south.

If sagebrush cannot be replaced with short stature native grass between the greenstrip and the residences, we recommend removing the sagebrush and installing irrigated lawn as far out from the structure as possible on the south and west face of the homes (Figure 5).





Figure 7. Example of a structure upslope from moderate fuels with a well-established and maintained greenstrip adjacent to a home.

## Greenstrip 2

A majority of the area adjacent to greenstrip 2 is owned by the Jackson Hole Land Trust. Greenstrip 2 follows a two-track utility road on the north end of the development and was intended to connect with the north end of greenstrip 3. The two-track road is narrow with tall fuels on either side; it traverses through a decadent aspen stand with encroaching conifers and patchy openings of sagebrush. The 2007 plan recommended upgrading the two-track to allow for emergency use; based on current recommendations from Fire/EMS the two-track should not be used for emergency egress.

Since 2007, some dead and downed wood has been removed on the south and west side of the utility road. Given the current condition of the road and based on recommendations from Fire/EMS, the idea of improving the two-track is being abandoned. Instead, efforts should focus on fuel reduction within the area identified in Figure 8.



Figure 8. Treatment area associated with greenstrip 2.

As described in the 2007 plan, from the portion of the road west of the north/south section of the two-track and south of the east/west two-track, conifers within 50 feet of the road should be removed to limit the chance of a crown fire and firebrands (Figure 8). Conifers between 50- and 100-feet of the road should be limbed to a height of 8-10 feet. Limbing removes the lowest limbs on a tree, giving it a groomed look but more importantly removes ladder fuels from the system.

Sagebrush should be treated with a brush mower as described for greenstrip 1 in the 2007 plan; greenstrip width will vary based on slope but should be at least 10 feet on both sides of the road. Mowing should be done when fuels are green or with light snow cover in case a mower blade strikes a rock and creates a spark.



Figure 9. Undergrowth and deadwood adjacent to the utility road.



Figure 10. North end of greenstrip 3 where it joins greenstrip 2.



## GREENSTRIP 3



Figure 11. Greenstrip 3 C.



Figure 12. Horse trail going into the aspens on the north side of the butte from greenstrip 3A to 2.

Greenstrip 3 was divided into three sections. The southern portion of the greenstrip (3C) is completely installed and now requires minimal maintenance. The SCHOA has taken some action to implement recommendations to Sections 3A and 3B but not to the level prescribed in the 2007 plan.

Greenstrip 3A was recommended to have dead and downed wood removed from the sewer line downslope approximately 100 feet (or to the existing trail, whichever is farthest). Conifers within this segment should be removed or limbed to a height of 10 feet.

Greenstrip 3B was located directly east of the property line. Dead and downed wood was prescribed for removal up to approximately 30 feet from the property line and conifers were to be limbed to at least 8 feet within this section. Sagebrush and other low shrubs were prescribed for mowing within 3B.

Although the fire risk from the north is described as moderate by Teton County (compared to the higher risk from the west and south), failure to install the northern greenstrip increases wildfire risk to the property.

## GREENSTRIP 4

None of the recommended actions have been implemented for greenstrip 4. This greenstrip is SCHOA's best line of defense from a fire from the west and will improve safety if evacuation is needed. The entire length of N. East Butte Road has basin wildrye and sagebrush up to 10 feet tall. This plant community could fuel flame lengths greater than 30 feet, effectively cutting off egress of guests and homeowners and cutting off ingress for Fire/EMS.

We recommend mowing the downhill portions and the portions of the roads with taller grass and sagebrush back to 10 feet where possible. Areas with aspen should have the understory cut back to at least 10 feet. Aspen do not need removed but any encroaching conifers should be removed.



Figure 13. Sagebrush adjacent to N. East Butte Road.



Figure 14. Flat areas can be mowed back 10 feet.

Sagebrush and wildrye should be removed from the guardrails. Mowing should occur before vegetation turns brown and fire risk is elevated. Ultimately the wildrye will die from repeated mowing and should be replaced with a lower growing species that can tolerate regular mowing such as Idaho fescue, needle and thread or bluebunch wheatgrass. It must be recognized that this fuels treatment may have to take place several times per year to maintain treatment efficacy.

Teton County Roads and Levees mows Spring Gulch Road annually in July or August, depending on fuel moisture. They may not mow in very dry years. It is unlikely that Roads and

Levees can increase the width of their mowing due to the steepness of the roadside. Rather than attempting to widen vegetation control along Spring Gulch Road, Y2 recommends that additional effort be put into reducing fuels along N. East Butte Road and increasing the mitigation efforts described above for greenstrip 1.

## GREENSTRIP MAINTENANCE

Greenstrip maintenance is critical. As soon as the snow is melted out, all greenstrips should be walked to determine annual maintenance needs such as removal of deadfall or road repair. Greenstrips may require mowing multiple times during the growing season to keep grass heights low and flame lengths at manageable levels. We recommend at least one mowing by the end of June and



Figure 15. Wildfire in Washington. Photo Credit: Don Seabrook, The Wenatchee World.



another mowing before grass dries out and before the fire season begins. Annual maintenance is key to the success of this plan.



Figure 16. Vegetation maintenance for the south corral.

## ADDITIONAL AREAS OF CONSIDERATION

**Horses** – If horses cannot be evacuated in a timely manner, the south corral at the Western Riding Center should be used to keep horses on the property. The corrals need maintenance to provide shelter for horses and vehicles in case of wildland fire. Both corral fences should be rebuilt. Vegetation should be mowed in the north corral and between the north corral and the existing parking lot. Mowing should also occur on the north and east side of the north corral to the property line. Aspen do not need removed but all sagebrush and tall grass should be treated. The parking lot west of the corrals should be cleaned of debris (i.e., old wood poles).

Vegetation on the south and east side of the south corral should be mowed as shown (Figure 16). A reinforced gate should be installed at the north end of the south corral to keep horses in place.

**Vehicle Parking** - The Western Riding Center's parking area should be used to park vehicles in case of a **STAY** order. SCHOA vehicles should be parked in one area to make it easier for an influx of vehicles. All vehicles in the parking lot should be in good working order and not leaking fuel or other liquids.

Vegetation between the corral and N. East Butte Road should be mowed annually. All excess material such as firewood should be stored away from vehicle parking areas.

**Pump Houses and Water Storage Tank**– Areas proximate to the pump houses and water storage tank should be mowed annually to create a fuel break of at least 50 feet. The pump houses are critical to maintain water availability throughout the property and will house an emergency siren.

## WATER SYSTEM RECOMMENDATIONS

The SCR water system contains three wells, pump houses and a large storage tank. There are also many hydrants located throughout the property. Y2 and Fire/EMS recommends that the SCHOA evaluate the existing water system to understand its ability to provide water for irrigation needs, including maintenance of greenstrips, and potential firefighting needs. This evaluation should be done in conjunction with SCR staff, Jackson Hole Fire/EMS, and other appropriate entities and necessary improvements made to ensure the system can withstand a scenario requiring high water use.

## RECOMMENDATIONS FOR STAND-ALONE HOUSES

Even with implementation of the proposed actions in the open space, stand-alone houses should implement Firewise principles. Research has found that embers piloting small flames are the primary ignition sources in wildfires.

A vast majority of properties at SCHOA are irrigated and maintained, landscaped properties. However, not all landscaping is designed or maintained for fire safety. In many cases, tall, unirrigated vegetation is being allowed to encroach on homes. This, compounded by steep slopes, puts all properties at risk. There are steps that can be taken to minimize the risk of landscaping contributing to a catastrophic fire.

### VEGETATION MANAGEMENT FOR STAND-ALONE HOMES

There are methods for homeowners to prepare their homes to withstand ember attacks and minimize the likelihood of flames or surface fire touching the home or any attachments. Research has 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 17. Sagebrush between greenstrip 1 and homes.

We recommend removing tall grass, shrubs (particularly sagebrush) and limbing or removing conifers between the open space greenstrips and homes. Figure 17 shows sagebrush and tall grasses uphill from the greenstrip and below a private home. The NFPA provides recommendations regarding tree spacing in relation to each other and structures. If conifers are irrigated and limbed to at least 10 feet, their canopy should not be within 10 feet of a structure. If they are within 30 feet of the structure, they should be limbed up and have a minimum of 18 feet between canopies. Thirty to sixty feet out from the structure the canopies should have 12-foot spacings. Deciduous trees such as aspen and willows can usually remain closer together in these zones due to their high moisture content and lower volatile oil contents.

See Figure 18 for more details for tree spacing. Chapter 2 of the SCHOA Wildfire Management Plan – Wildfire Risk Reduction for Structures, provides more information on vegetation management on private lands and adjacent to structures.

## TREE SPACING

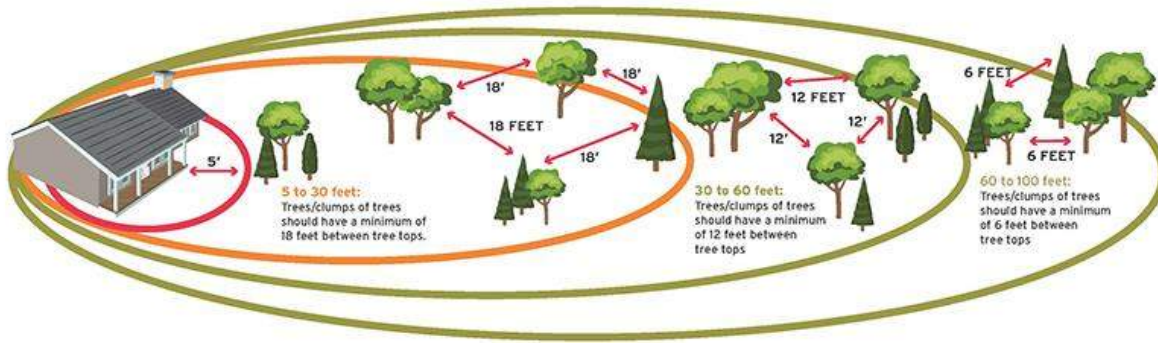


Figure 18. NFPA recommended tree spacing.

## RECOMMENDATION SUMMARY

In summary, we recommend immediately implementing the outstanding recommendations from 2007, with some modifications and additions.

- Greenstrip 1: Implement 2007 recommendations:
  - Mow annually prior to wildfire season
  - Expand greenstrip width to 30 feet wherever possible, which may include participation from private landowners
  - Evaluate and repair sprinklers annually; extend the sprinkler system where not covered by private lots
  - Remove ladder fuels downslope of the greenstrip
  - Remove sagebrush and tall grass between greenstrip and structures on west side
- Greenstrip 2: Implement recommendations in coordination with the Jackson Hole Land Trust and Teton County Scenic Preserve Trust, including:
  - Remove conifers within 50 feet of the two-track road
  - Limb conifers to a height of 8-10 feet between 50- and 100-feet south and west of the utility road
  - Mow to 10 feet on both sides of the roads where allowed by slope
- Greenstrip 3: Implement recommendations where greenstrip 2 and 3 meet and in the northeast corner of the property, including:
  - Clear dead and downed wood from the sewer line downslope approximately 100 feet (or to the existing trail, whichever is farthest). Conifers within this segment should be limbed to a height of 8 to 10 feet.
  - Remove dead and downed wood within approximately 30-feet of the property line; limb conifers to 8-10 feet
- Greenstrip 4: Implement with modifications
  - Mow N. East Butte Road as prescribed above under Greenstrip 4 as soon as possible.
  - Coordinate with Teton County Roads and Levees to mow the right of way on Spring Gulch Road between the intersections of E. North Butte Road and the two-track road
  - Mow/limb/remove trees as prescribed
- Evaluate existing hydrant, irrigation and pump system to determine if the systems can withstand irrigation and potential firefighting needs. Work with SCHOA and Jackson Hole Fire/EMS to address the water system.

Implementation of a risk and mitigation educational effort by SCHOA is essential to making this plan work. SCHOA should work with Jackson Hole Fire/EMS, TCD and other partners to develop a series of educational efforts that should be strongly recommended for viewing by SCHOA residents.



## **Appendix A: GREENSTRIP MAP, INSTALLATION AND MAINTENANCE STATUS FROM 2007 PLAN.**

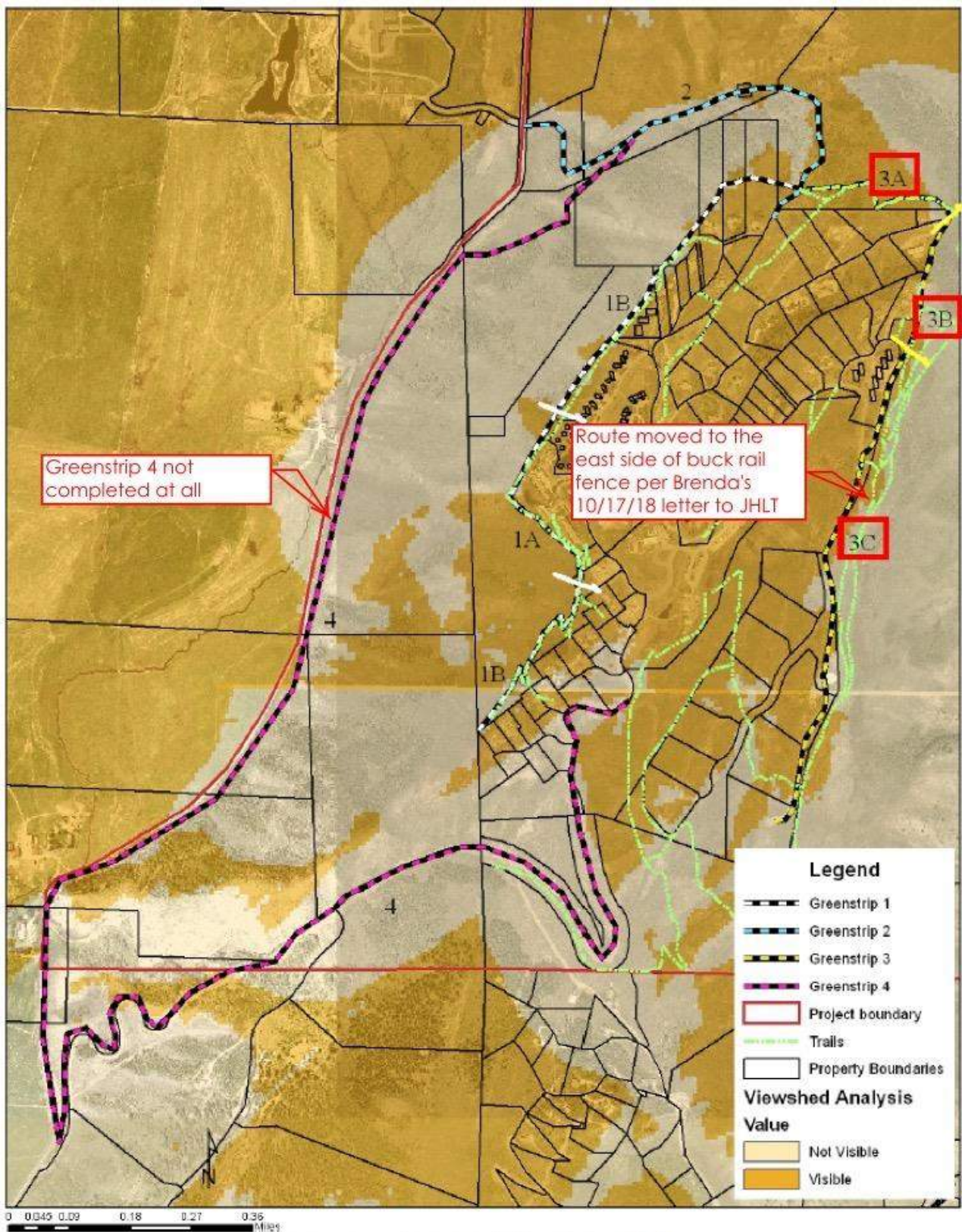


Figure 19. Overall map of greenstrips.



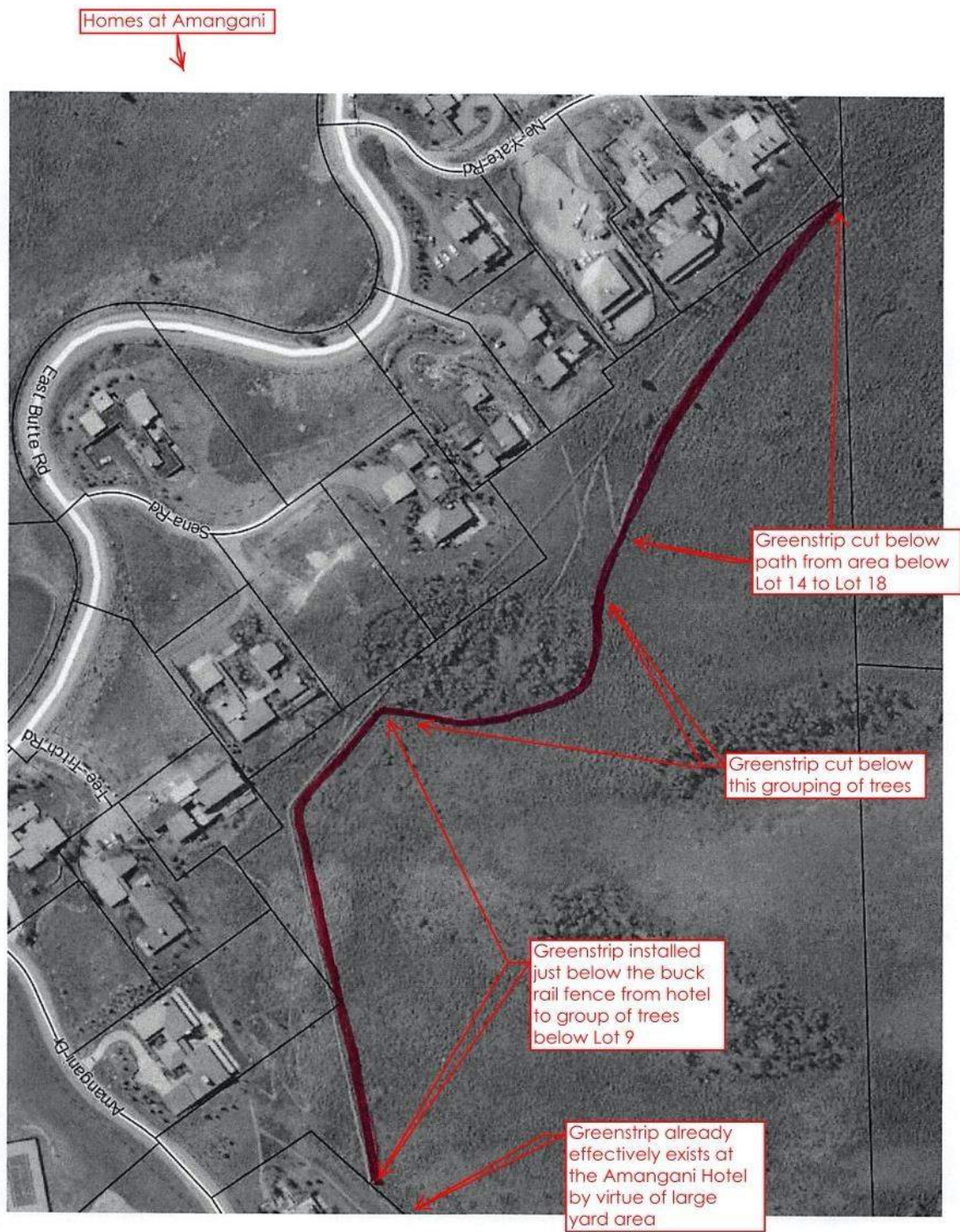


Figure 20. Greenstrip 1A/B, south of Amangani and The Homes at Amangani.



Figure 21. Greenstrip 1 B on the northern end of the property.



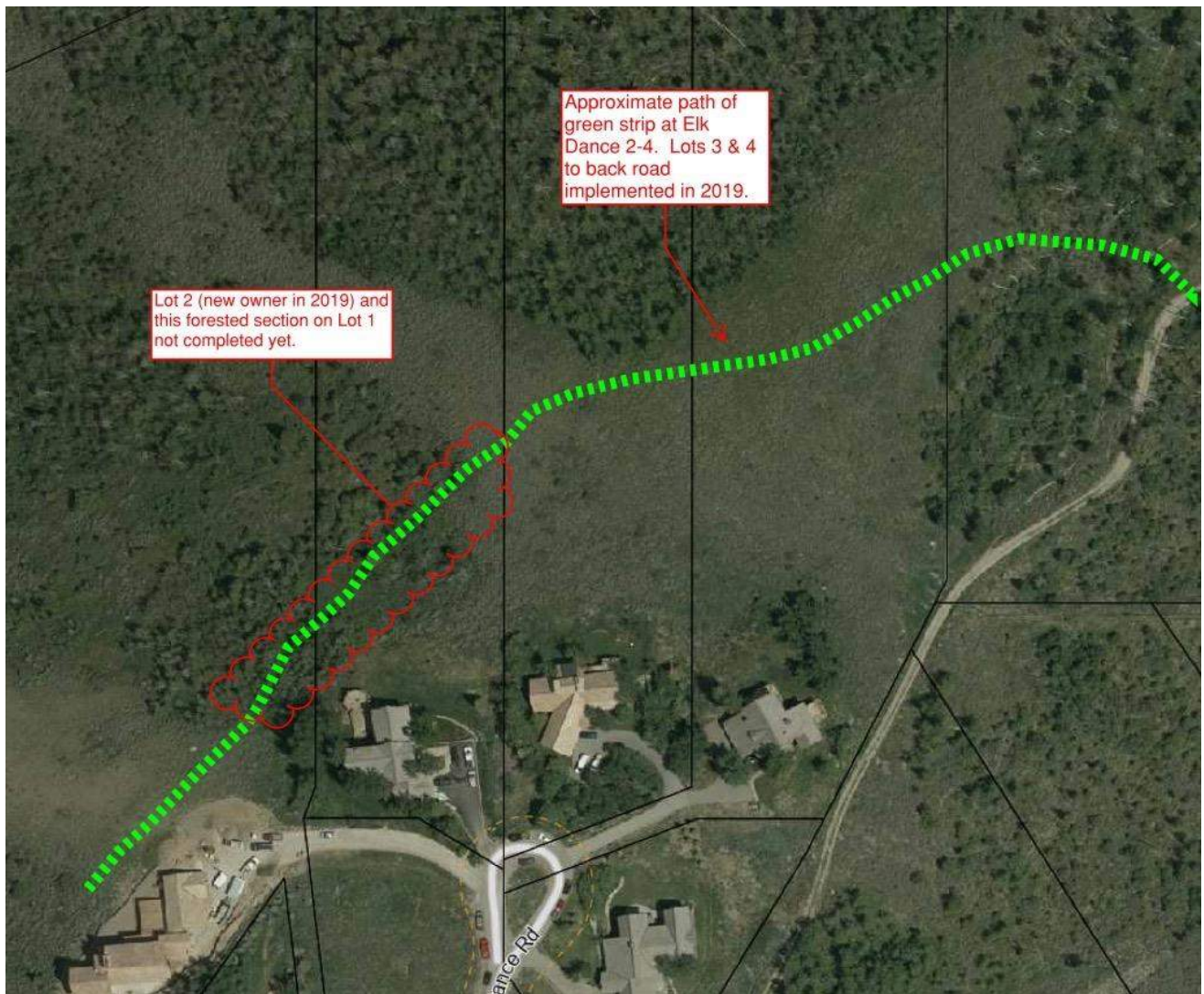


Figure 22. Greenstrip 1B where it connects to greenstrip 2.