











# Tale of Two Fires:

Progress Towards Action in Sevier County, Tennessee

#### **David Puckett**

Sevier County Fire Administrator

Fire Chief



#### **Brook Smith**

Area Forester

Public Information
Officer



#### Allana Funderburk

Forest Action Plan Coordinator



#### **OVERVIEW OF SEVIER COUNTY...**





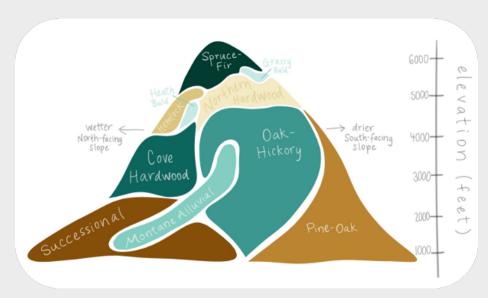




#### East Tennessee Forest Types

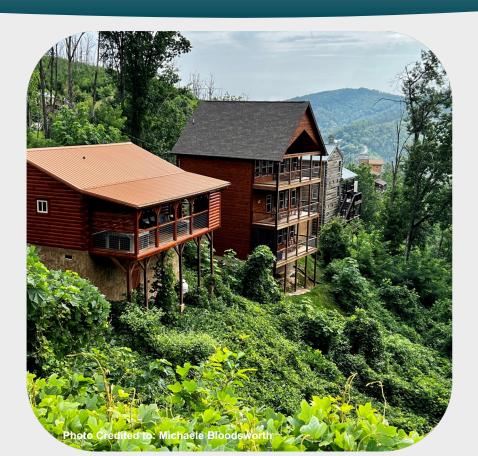
- Spruce-fir forest
- Northern hardwood forest
- Cove hardwood forest
- Hemlock forest
- Oak-hickory forest
- Pine-oak forest.
- Montane alluvial forest
- Successional forest

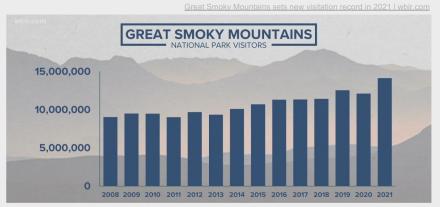
An eastern temperate deciduous rainforest is found in the highest peaks of the Great Smoky Mountain National Park.



Vegetation Types - Great Smoky Mountains National Park (U.S. National Park Service) (nps.gov)

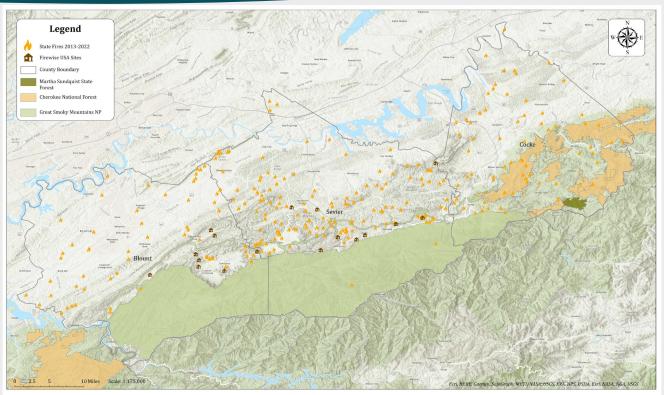
# East Tennessee Wildland Urban Interface (WUI)







#### Wildfire Occurrence and Firewise USA® Sites near Federal Partners



Wildfire occurrence and Firewise USA sites near Great Smoky Mountains National Park

280 fires reported by Tennessee Division of Forestry in Blount, Sevier and Cocke County from 2013 through 2022.

17 active Firewise USA Sites in Blount and Sevier county.

#### **East Tennessee Wildfire**

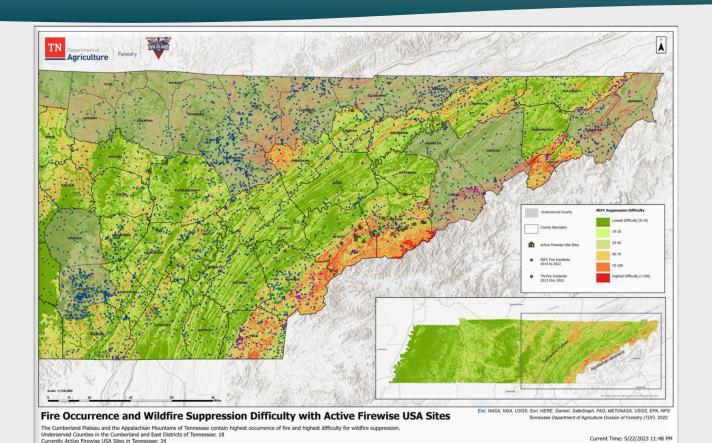
- Official Season: October 15 May 15
- Most fires occur in November and February – April
- Historically, our worst fire seasons occur in the spring.
- Drought extends leaf fall period
- Primarily deciduous forest
  - Leaf litter ground fires are common





Video Credited to: Brook Smith

# East Tennessee Suppression Difficulty



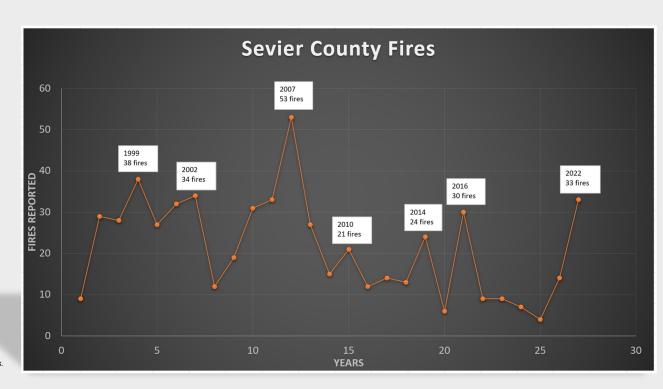
User: Michaele Bloodsworth

#### **Recent Sevier County Fire History**

#### Since 1996...

- Over 32,700 acres burned.
- A total of 2,693 structures lost.
- More than 1,400 threatened structures were saved.
- Wildland firefighters responded to 583 wildfire calls.

<sup>\*</sup>Based on state data, does not account for local wildfire/structure responses.



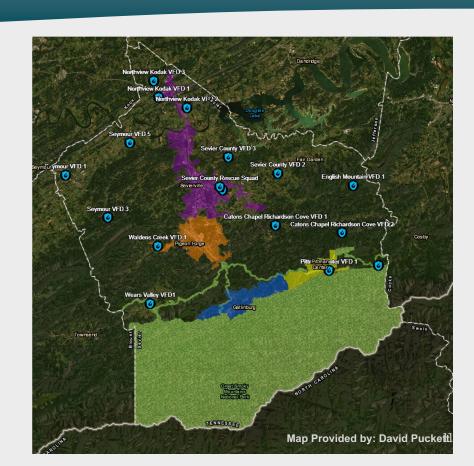
#### Sevier County Fire Suppression

#### Wildland- TN

- Caterpillar D4 Bulldozer with Transport
- John Deere 650k Bulldozer with Transport
- 2 Type 6 Engines
- 1 ATV
- 4 Full-time positions

#### Structure- Sevier County

- 17 Stations
- 243 Firefighters
  - Majority being volunteers
- Each station has engines, tankers, and brush rigs
- Running an average of 6,500 calls annually
- 250 confirmed structure fires per year
- Same # of brush fires



# Timeline of Recent Events, Mitigation Actions, and Community Engagements



#### 2003 Bluff Mountain Firewise USA®









#### 2007 Cove Mountain Fire

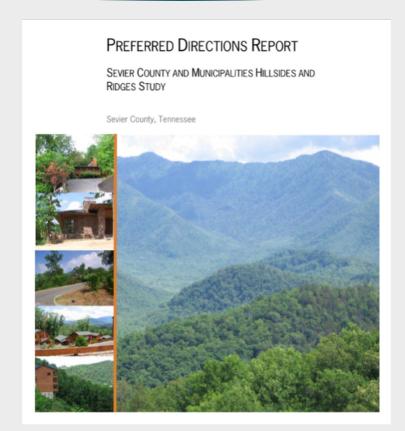
- First wake up call of the growing WUI risk in Sevier County.
- Firefighters evacuated from the mountain instead of suppressing the fire due to safety concerns.

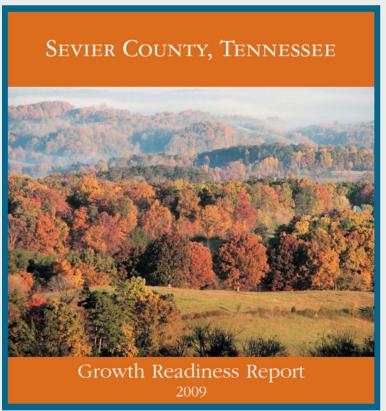






## **Sevier County Reports**





#### 2009 Lower Bluff Mountain Fire

- Lower Bluff Mountain fire was located below the Upper Bluff Mountain Firewise USA® Community.
- Much of this area is short term rental cabins.
- Bluff Mountain has a large component of pine trees which is a more fire-adapted species.
- Upper Bluff Mountain is the location for essential towers for county radio communications.





## 2009 Wears Cove Gap Prescribed Fire

NATIONAL PARK SERVICE

- Prescribed fire for wildlife habitat, ecosystem services, and fuel loading reduction.
- Areas regularly burned include: Cades Cove, Lynn Hollow, and Wears Cove Gap.
- Actions taken have been adjacent to several communities including Wears Valley and Top of the World. Top of the World is a Firewise USA® site.







## Continuing Programing...

- Most efforts went into working directly with the communities including Cobbly Nob, Upper Bluff Mountain, and English Mountain.
- 2013 Black Bear Cub Way fire
  - Structure-to-structure ignition caused by a hot tub short-circuiting.
  - A wildfire spotted from this structure fire.







Photo Credited to: Nathan Waters

#### **Chimney Tops 2 Fuels**

- Hardwood stands
- Pine stands
- Shrub-layer dominated by mountain laurel and rhododendron both of which have a waxy cuticle.
- Urban fuel component

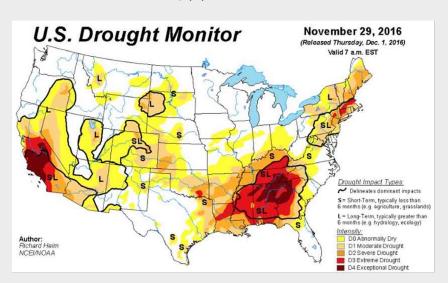


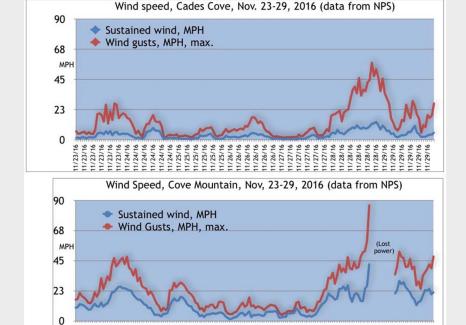




## Chimney Tops 2 Climate Conditions

- Extreme Drought
- RH ~17%
- Wind Gusts up to 87 MPH
- KBDI Index: 599





Analysis of wind, vegetation, and air tankers before the fire burned into Gatlinburg - Wildfire Today



- A topo-atmospheric phenomenon.
- Mountain waves form when stable air passes over a range causing local turbulence and gravitational effects on the leeward slope.
- Occurs roughly 5-7 times per normal year.





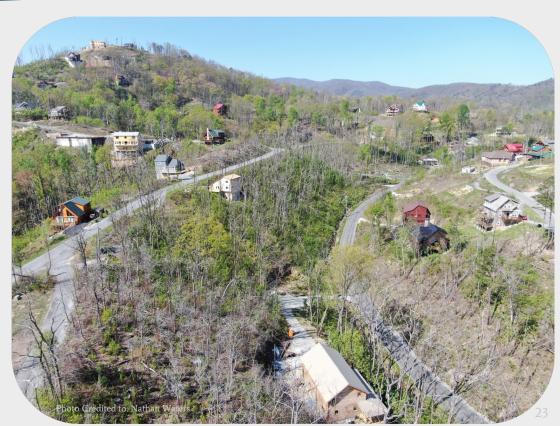
# **Chimney Tops 2 Fire**



### **Chimney Tops 2 Fire Impacts**

- November 28, 2016
- Burned Area: 17,900 acres
- Structures Destroyed: 2,460
- ~\$2 Billion in Damages
- 200 People Injured
- 14 Souls Lost





# **Chimney Tops 2 Fire – Fuel Loading Post-Fire**





#### **Chimney Tops 2 Fire Impacts – Fuel Loading Post-Fire**

- 100% canopy removal in areas.
- Large amount of standing snags and heavy fuel-loading laying on the ground in the WUI.
- Flashy fuels already building up in the understory amidst the down woody debris.









# Chimney Tops 2 Fire Impacts – Snags and Down Woody Debris

- Snags are a huge risk within the WUI because they are above ground-level which can cause embers to be carried by winds.
- Home owners need to be emberaware since there are abundant snags in the area.
- Utilities dropped countless snags that threatened ROWs but blocked them up and left them in ditches or along the road side.





# **Chimney Tops 2 Fire Impacts— Regrowth**









#### Chimney Tops 2 Fire Impacts— Exotic Invasive Plant Species

• Exotic invasives: kudzu, royal paulownia, tree-of-heaven, mimosa, miscanthus grass, privet, and others.

Exotic invasive plants are found readily around East
 TN due to favorable growing conditions

 100% canopy destruction around urban infrastructure provides new growing space

















#### Chimney Tops 2 Fire Impacts — Social

- Aversion to Rx Burning
- Considerate Communications/ Messaging
- Increased resources devoted to mitigation and post-fire recovery.
- Risk Acknowledgement
- Community Engagement







#### Since 2017....

#### In Tennessee:

- Active Firewise USA sites: 24
- Over 64,000 cubic yards of flammable vegetation removed
- Over 170,600 hours invested into Firewise USA best practices
- Total investment of \$5.4 million



- 10 Active Firewise USA Sites
- 12 CWPP's Prepared and Approved







Community Engagement

Building Capacity

Growing Partnerships



#### 2017 Chalet Village Firewise USA® Recognition Celebration







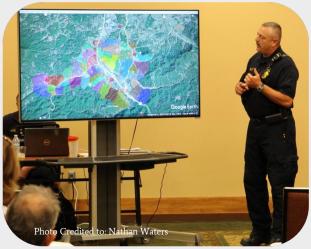


#### 2017 Pigeon Forge Firewise USA® Meeting

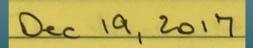
- Pigeon Forge was a pilot site for the Ready,
   Set, Go program and has always been
   progressive with fire management.
- Pigeon Forge has many values at risk in their jurisdiction including Dollywood Theme Park.







# **Smoky Mountain Roots**





https://www.smokymountainroots.org/



# **Smoky Mountain Roots – First Planting**

Sad.

Feb 24, 2018 1st Planting

250 K Tree Day

T volunteers + myself assisted plantings

6 Assisted plantings.







# **Smoky Mountain Roots – Growing**

2018 The trees just Kept coming.

MARCH 10,2018 1001 Trees out

MARCH 30,2018 1531 Trees out

APR. 2nd on my way to get more trees.







Photos Credited to: Cherise Guesford

# 2018 Gatlinburg FireWise USA® Day







# 2018 Ski Mountain Fuel Reduction Project



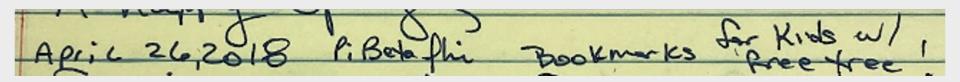






Photos Credited to: Matt Wood

### Smoky Mountain Roots – Earth Day Outreach









Photos Credited to: Cherise Guesford

#### 2018 Pigeon Forge CPAW



- Pigeon Forge hosted the Community Planning Assistance for Wildfire (CPAW) into the area post Chimney Tops 2.
- Field Tour to survey the community and the landscape.
- Develop a report with recommendations.
- Facilitate a training focused towards planners within the local jurisdictions of several East Tennessee Counties.



https://cpaw.headwaterseconomics.org/what-we-do/







#### 2018 CPAW Facilitated Training



#### WUI Context

- Ingress and Egress
- Density and Size of Structures
- Building Construction Methods and Materials
- Dense Vegetation in Proximity to Structures
- Presence of Other Ignition

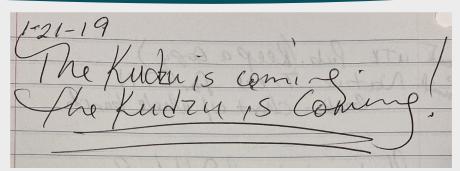
#### Stakeholder Training

- WUI Fire Behavior
- Wildfire Hazard and Risk Assessment
- Wildfire Risk Relationship to Planning
- Land Use Planning Tools
- Recommendations on Future Planning





#### **Smoky Mountain Roots – Noticed a Problem**









#### **Smoky Mountain Roots – Youth Outreach**

Girl Scout troop # 20444 out of Knoxville. Achievingthe "Silver Award"





Photos Credited to: Cherise Guesford

#### **Strengthening Communications**

# May 31,2019 Outdoor Siren Test Sevier Co.



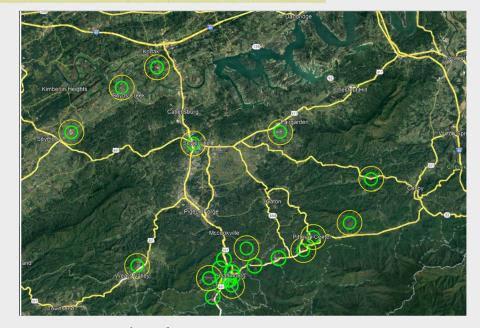
#### Modular (Loud Speaker)

- capable of producing an audible sound, voice, and music
- can provide an audible alert followed verbal instructions of the requested action as dictated by the event.



#### Mechanical

only capable of providing an audible alert to the community.



Location of Outdoor Warning Systems in Sevier County

#### July 14, 2019 Creation of David's Position – Fire Administrator

- Fire service is a non-essential service in TN.
  - EMS and Law Enforcement are essential services.
- Coordination of efforts between the 9 volunteer agencies and 3 municipal agencies that provide services to the county.
- Ensure crew cohesion and responder readiness.
- Strategic planning for the future.
- Misson: Excellence is achieved through cooperation, education, preparation, and mitigation.







#### **Smoky Mountain Roots – Outreach Partnership**

Ang 9, 2019 Smokey Bear's 75 on Birthday Party







Photos Credited to: Cherise Guesford

#### Kudzu Crisis in Burned Area



Sevier County pushes to battle kudzu infesting areas hit by wildfires

### 2020 Kudzu Town Hall



Video Credited to: David Tiereny

#### **Smoky Mountain Roots – Expanding Focus**

3/13/20 Romde tone wild Hower grass mix 40 165







# March 16, 2021 Utility Training – Local Partners







### 2021 Successful Mitigation — Message Received

- Outreach beforehand caused mitigation by a homeowner.
- Information Officer worked with the media to communicate this success.

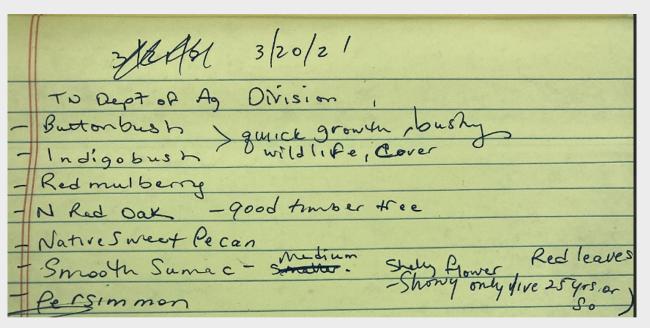








#### Smoky Mountain Roots – Continuing the Mission







Photos Credited to: Cherise Guesford

# 2021 Wears Gap Cove Prescribed Fire







### **UT Extension Field Trip**

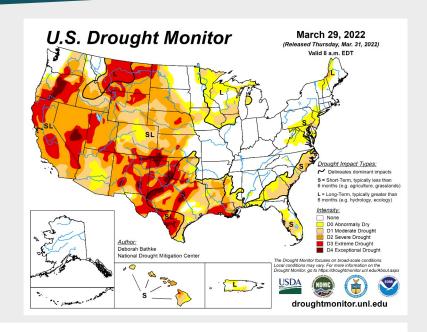
- Site visit to RoundStone Native Seed included a presentation and facilities/field tour.
- Partners included:
  - o UT Extension
  - Master Gardeners
  - Smoky Mountain Roots
  - Firewise USA® Site community members
  - TN Division of Forestry.





#### **Indigo Lane Environmental Conditions**

- Normal drought index
- Expected Max Wind Gusts: 80 90 MPH
- Red Flag Warning:
  - Strong Winds
  - o Low RH
- Crews were on heightened alert due to weather conditions



#### .DISCUSSION...

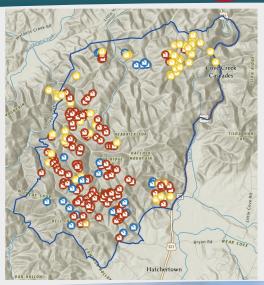
Critical fire weather conditions are expected into tonight as low fuel moisture, low humidity, and very strong winds overlap.

### Indigo Lane Fire Impacts



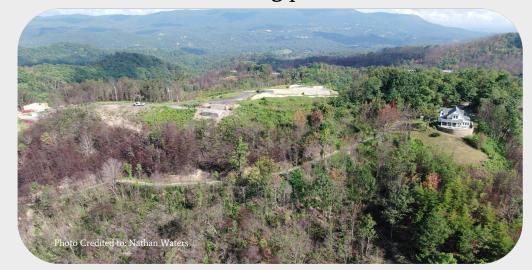
- March 30, 2022
- Burned Area: 2,498 acres
- Structures Destroyed: 213
- Structural Fire Fighting Equipment Lost: 5
- ~\$65 Million in Damages
- ~\$3 Million in Suppression Costs
- Grand Divisions IMT assisted with suppression

Destroyed
Minor
Affected



### Indigo Lane Fire – Fuels Post-Fire

- Mixed fire effects depending on aspect.
- Rebuilding began almost immediately.
  - New construction seems to reflect resilient building practices.







#### Indigo Lane Fire Impacts – Social

- Recognition that disastrous wildfires can occur outside of drought conditions.
- Request for a Community Mitigation Assistance Team (CMAT).
- Renewed vigor between the community leaders and the community in regards to action on pre-planning and mitigation.
- Better communications between partnering agencies.





#### 2022 CMAT Meeting



- CMAT is a team of mitigation professionals from different parts of the country that brings a fresh eyes with new perspective.
- CMAT provides the county with a field survey, a series of interviews to inform a SWOT exercise, a workshop with local resources to brainstorm ideas for the area, and a report.
- This dialogue between Sevier County and these mitigation professionals continues to this day.

https://www.fs.usda.gov/managing-land/fire/cmat

#### Sevier County, Tennessee



Prepared by the Community Mitigation Assistance Team
May 18, 2022







# 2022 Wildfire Community Preparedness Expo







#### April 2023 Forestry Commision Meeting – Nashville

- Advancement of fire services to protect and educate the citizens of Sevier County.
- Update of code improvements made since the 2016 fires.
- Promoting Firewise USA<sub>®</sub> construction; working with insurance companies to provide discounts.
- Ensuring new developments are more fire ready than in the past.
- Working with Sevier County to implement hazard mitigation strategies at county and community levels.



# 2023 Wildfire Preparedness Expo













#### 2023 Great Smoky Mountains National Park Safety-Mitigation Day

- TDF and Gatlinburg FD working with federal partners.
- 19 Volunteers
- Leaves were mitigated away from the historic structures in Elkmont.







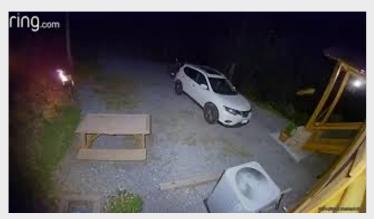


#### December 14, 2023 Short-Term Rental Program

- Two programs across a week to communicate the need for this new inspection program.
- Over 6500 short-term rentals were identified in the first year.
- The community was cautious but receptive.









Geo Credited to: Cherise Guesford 64

#### 2023 Welcoming the New Sevier County Fire Unit – Local Partners

 TDF meets the new Sevier County Fire and EMS unit.

 Introductions, process, capacity, operations, and mitigation were







### 2024 Wildfire Mitigation BMP Course – Expanding Capacity



- 2-day course conducted by Coalitions & Collaboratives.
- 36 students from 6 counties.

https://co-co.org/programs/community-wildfire-mitigation-best-practices-training/



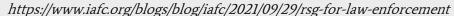




#### 2024 Wildfire for Law Enforcement Training – Collaborations



- IAFC and subject matter experts from Estes Park, CO.
- 17 attending
- LEOs from city, county, state, and NPS.
   Structural and wildland fire as well.





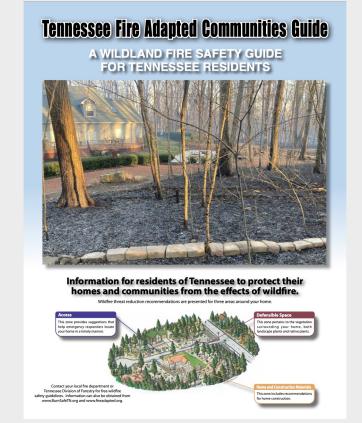




#### Changing the Culture

FIRE RATING TODAY **FIRE DANGER** LOW **Rating Levels** 5 EXTREME 4 VERYHIGH Only you HIGH **Can Prevent** MODERATE Wildfires LOW **TUNE TO 1680 FOR EMERGENCY NOTIFICATIONS** Photo Credited to: Allana Funderburk

https://www.tn.gov/content/dam/tn/tnwildlandfire/documents/ prevention/fac/TN\_FAC\_Communities\_Guide.pdf



#### Raising Community Engagement

- Quarterly FAC Meetings
- Community Equipment Hub
- Annual Wildfire Preparedness Expo
- Developing Vendor Services Program
- Collaboration with Federal Partners
- Firewise USA® Cleanup Days







#### TNC's Don't Move Firewood Campaign

- 2008 Present
- Prevent introduction of invasive insects on Firewood.
- 2015- only heat-treated firewood that is bundled with a certification stamp by the USDA or TN Department of Agriculture is allowed for use in the campgrounds of GSMNP.
  - Campers may also collect dead and down wood within the park for campfires.



#### MOVING FIREWOOD TRANSPORTS TREE-KILLING INSECTS AND DISEASES







TN Department of Agriculture Forestry





### The Nature Conservancy and National Park Service Partnerships

TNC conducts prescribed fires on approximately 100,000 acres annually on ecologically suitable area in the southern Appalachian Mountains.









#### Fire Learning Network

 Join partners to collaborate, develop, share, and apply the best available science to restore fire across our diverse region.

#### Goals:

- Implement management based on the Landscape Conservation Forecasting process
- Advance resource sharing to build capacity for large-scale cross-boundary treatments
- Expand landscape-scale Ecomath analysis to additional sections of the landscape
- Inspire engagement of additional stakeholders and new staff





https://firenetworks.org/fln/

#### **Restoration Rally**

- Follows Keep Sevier Beautiful's Kudzu Town Hall Format
- Speakers from local, state, and federal government and UT Extension.
- Inform the local community on restoration practices that can be implemented in an area where fire has moved across the land.



#### **Post-Wildfire Restoration Manual**

- Contents will include:
  - Fire Ecology
  - Site Assessment
  - Soil
  - Vegetation Management
  - Habitat Enhancement
  - Monitoring
  - Community Engagement
  - Funding Options
- Collaborative document
- Designed to be replicated to serve other communities that may be impacted by wildfire in the future.





#### What's Next?

- 80th on the 8th Smokey's Birthday and 2024 FAC Expo
- County attending SBR FLN to expand
- County applied for Community Wildfire Defense Grant (CWDG) funds for CWPP development
- Potential Partnership between Smoky Mountain Roots and a local tree service to expand capacity.
- Following the CWPP, the county plans to attain implementation funds through the CWDG
  - Shaded fuel breaks.
  - Buffer treatments around communities
  - Mitigating fuel loading next to essential infrastructure (comm towers and water towers)
  - Developing further projects
- Set systems in place for a resilient and sustainable community.



# Questions?



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