

Vegetation Management After Forest Wildfires

Jerome Otto

Market Development Specialist
Western PLM



vegetationmgmt.com

 Corteva U.S. Vegetation Management





Your Vegetation Management Partners



Visit us at
vegetationmgmt.com

Why Should We Care About Increasing Fire?

- Both fire frequency and severity are increasing.
- Property damage is increasing.
- WUI – Wildland Urban Interface increasing in population.
- Loss of wildlife and pollinator habitat.
- Carbon loss vs. sequestration.
- Air pollution.
- Water pollution.

Tribe: California Wildfire Near Oregon Causes Fish Deaths




This photo, provided by the Karuk Tribe Department of Natural Resources, shows dead fish found on a 32-kilometer stretch of the Klamath River in northern California between Indian Creek and Seiad Creek, Aug. 6, 2022, near Happy Camp, California.


Air Quality – Salmon, ID September 7, 2022




Air Quality – Western Nebraska, 9-13-22




**Until 1 PM
Tuesday**



**Poor Air Quality
Due to Wildfire
Smoke**



**Sensitive groups should
avoid excessive exertion
and minimize outdoor
activities.**

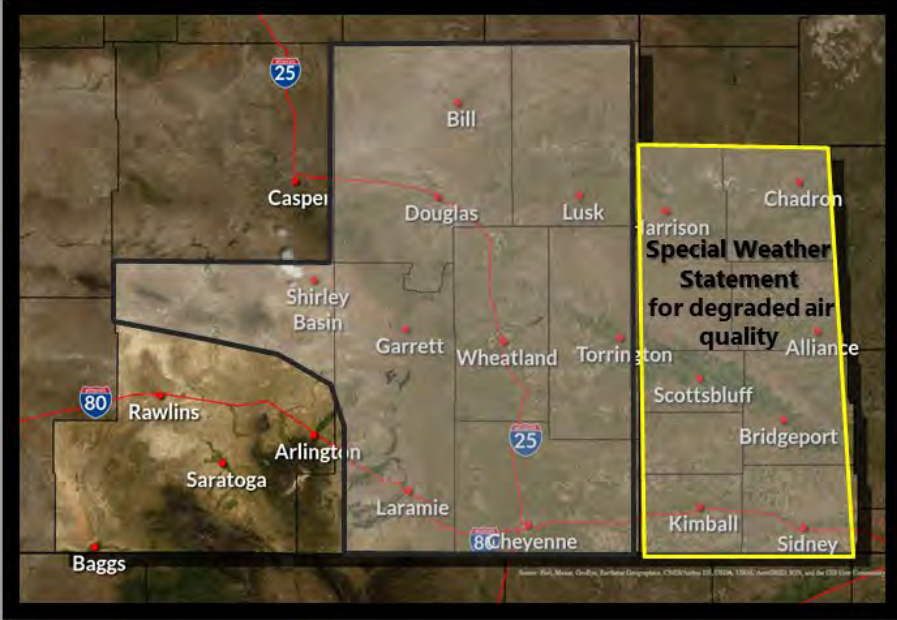


**NATIONAL WEATHER SERVICE
CHEYENNE WYOMING**

Wyoming Department of Health

**DEQ
WYOMING DEPARTMENT OF
ENVIRONMENTAL
QUALITY**

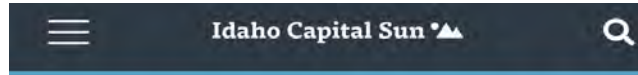
AIR QUALITY ALERT



**Includes the cities of Cheyenne, Laramie,
Douglas, Torrington, Wheatland, and Lusk.**

Published on: 09/12/2022 at 12:03PM

Air Quality Impact - Idaho



ENVIRONMENT HEALTH

As wildfires become common, Idaho's smoke season becomes a public health hazard

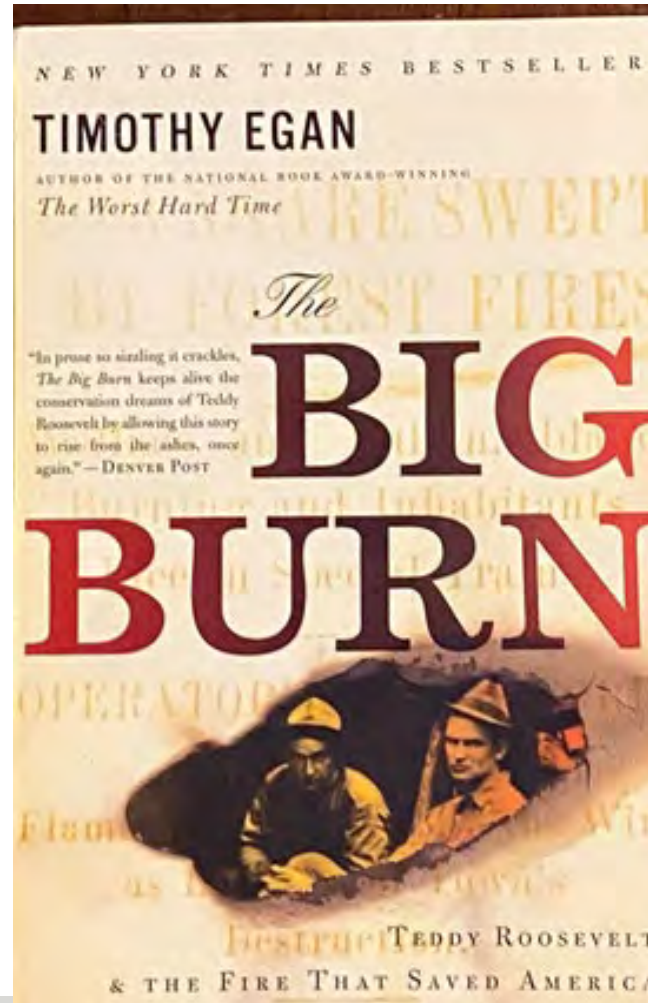
Idaho's air quality is getting worse, as forests burn in the West

BY: AUDREY DUTTON AND CLARK CORBIN - SEPTEMBER 23,

2022 4:26 AM



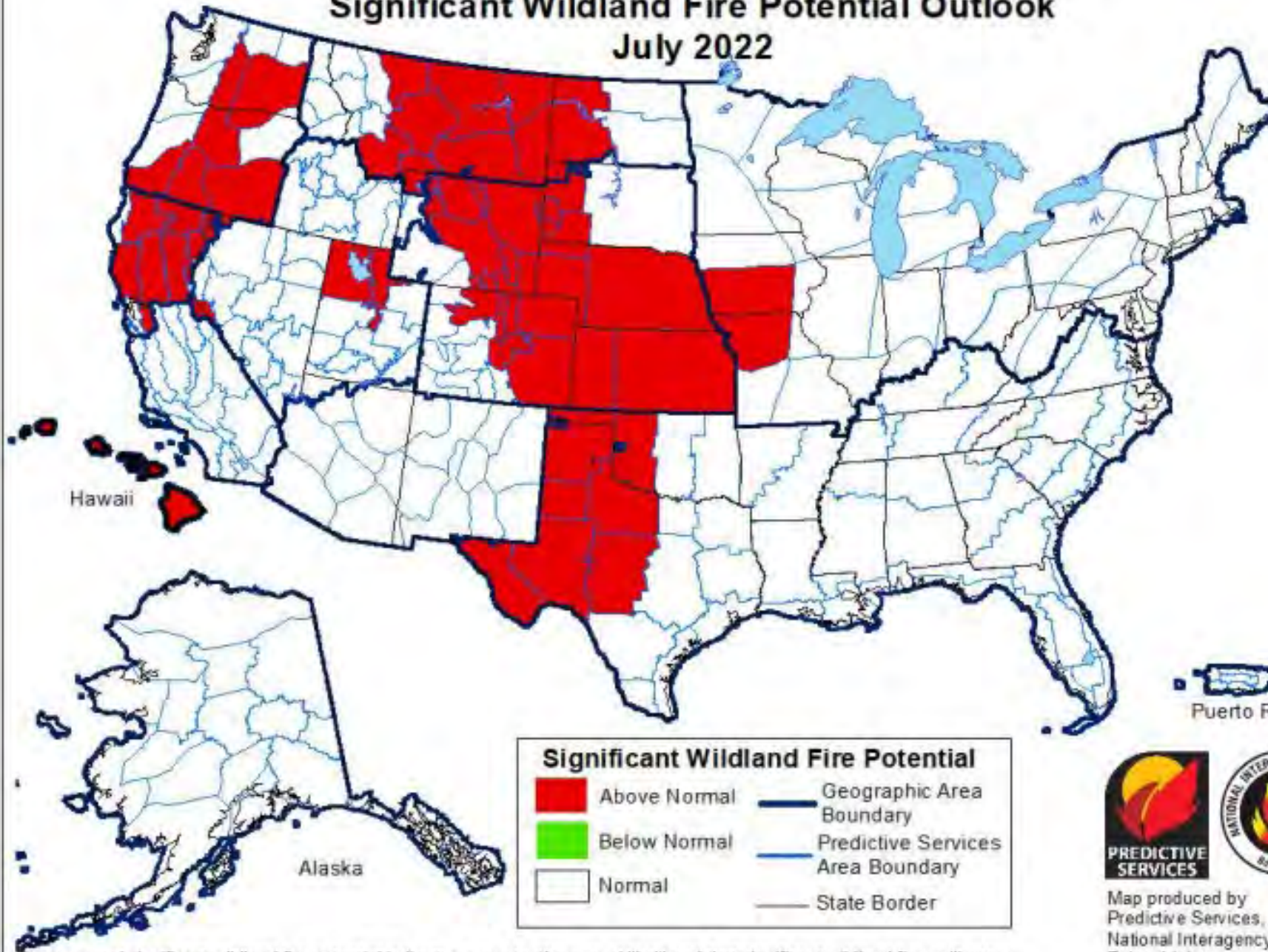
Fire Has Been Controversial For 110+ Years



The Big Burn – August 20, 1910

- Washington, Idaho, Montana
- Roughly 10,000 forest fighters assembled.
- President Teddy Roosevelt's vision of conservation.
- Gifford Pinchot, chief forester of newly created USFS.
- Bitter disagreement over forest use, management.
- Bitter disagreement over fire prevention, management.
- Sound familiar??

Significant Wildland Fire Potential Outlook July 2022

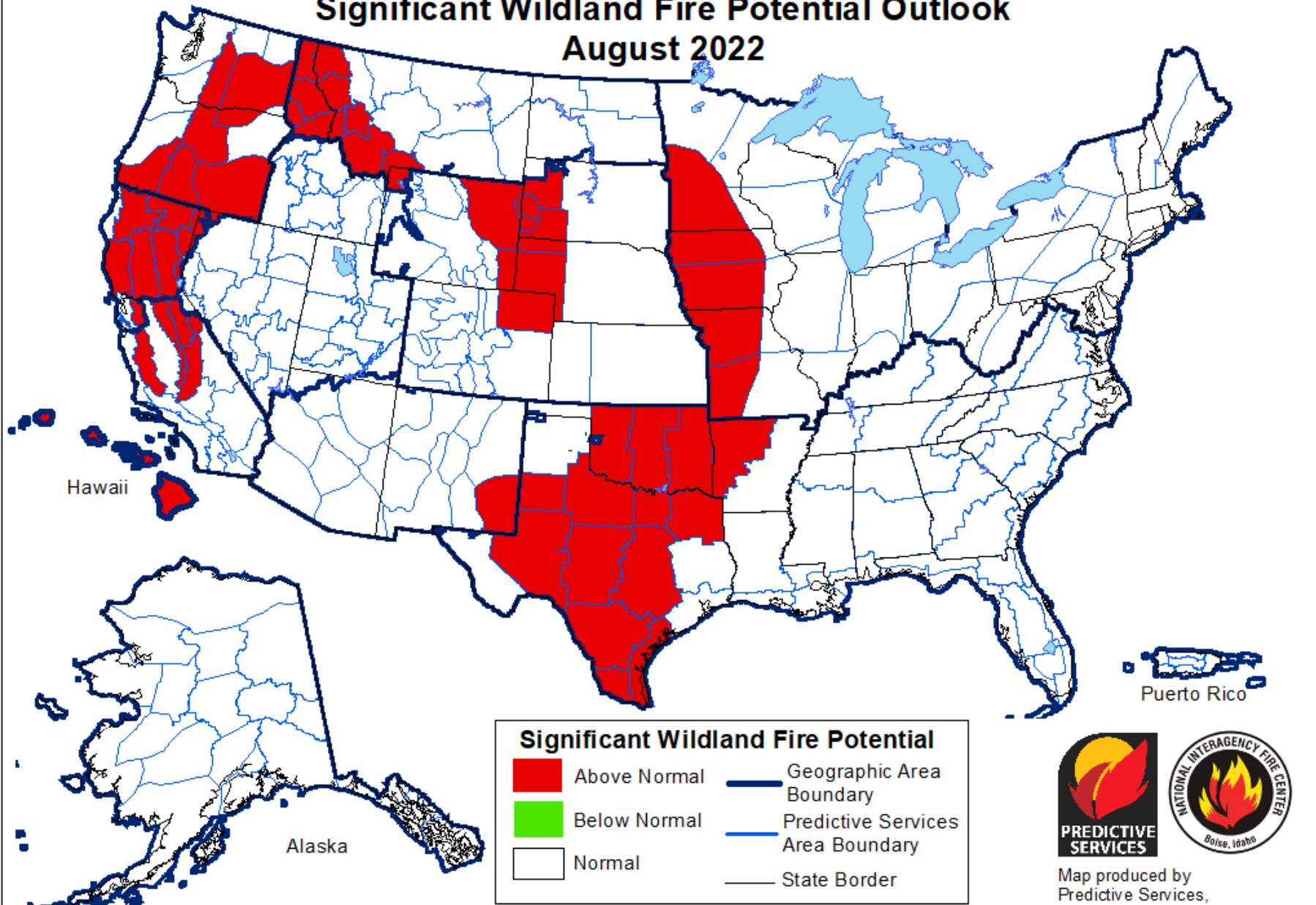


Above normal significant wildland fire potential indicates a greater than usual likelihood that significant wildland fires will occur. Significant wildland fires should be expected at typical times and intervals during normal significant wildland fire potential conditions. Significant wildland fires are still possible but less likely than usual during forecasted below normal periods.



Map produced by
Predictive Services,
National Interagency Fire Center
Boise, Idaho
Issued June 1, 2022
Next issuance July 1, 2022

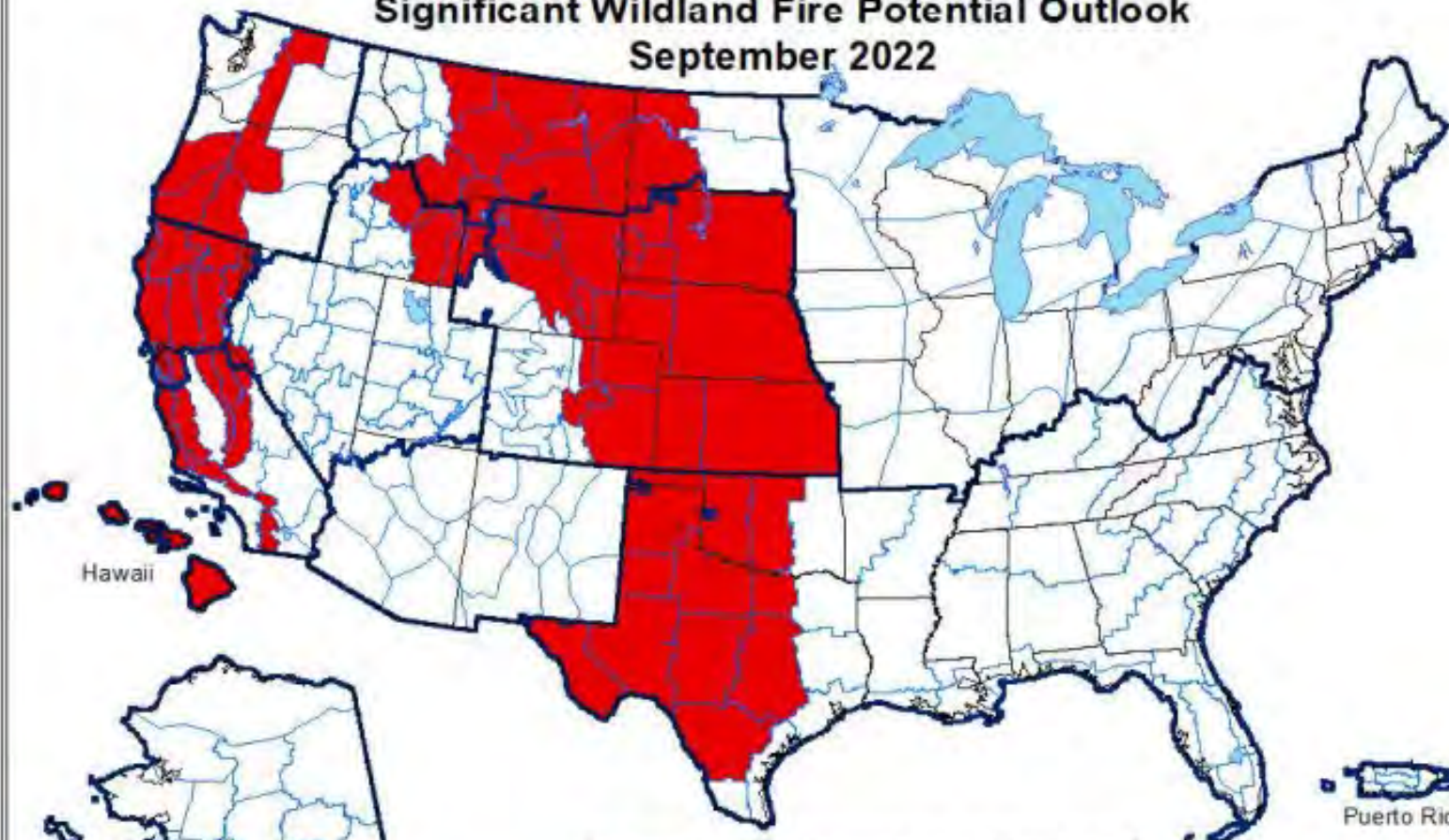
Significant Wildland Fire Potential Outlook August 2022



Above normal significant wildland fire potential indicates a greater than usual likelihood that significant wildland fires will occur. Significant wildland fires should be expected at typical times and intervals during normal significant wildland fire potential conditions. Significant wildland fires are still possible but less likely than usual during forecasted below normal periods.

Map produced by
Predictive Services,
National Interagency Fire Center
Boise, Idaho
Issued August 1, 2022
Next issuance September 1, 2022

Significant Wildland Fire Potential Outlook September 2022



Hawaii

Alaska

Puerto Rico

Significant Wildland Fire Potential	
	Above Normal
	Below Normal
	Normal
	Geographic Area Boundary
	Predictive Services Area Boundary
	State Border



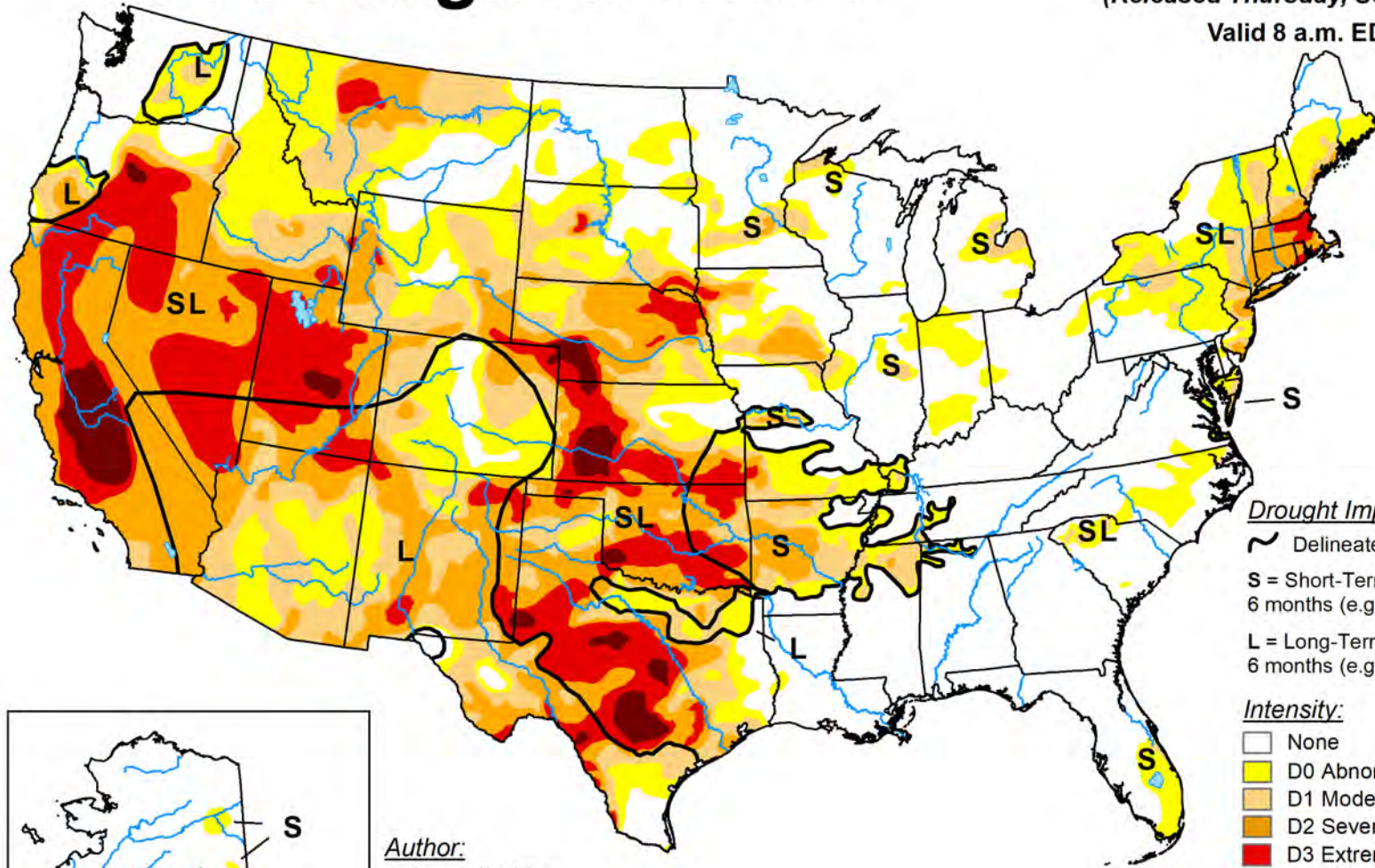
Map produced by
Predictive Services,
National Interagency Fire Center
Boise, Idaho
Issued June 1, 2022
Next issuance July 1, 2022

Above normal significant wildland fire potential indicates a greater than usual likelihood that significant wildland fires will occur. Significant wildland fires should be expected at typical times and intervals during normal significant wildland fire potential conditions. Significant wildland fires are still possible but less likely than usual during forecasted below normal periods.

U.S. Drought Monitor

August 30, 2022
(Released Thursday, Sep. 1, 2022)

Valid 8 a.m. EDT

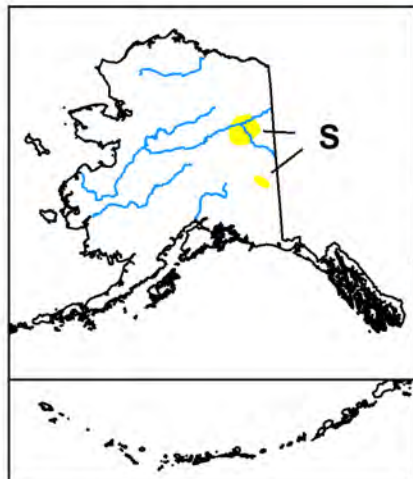


Drought Impact Types:

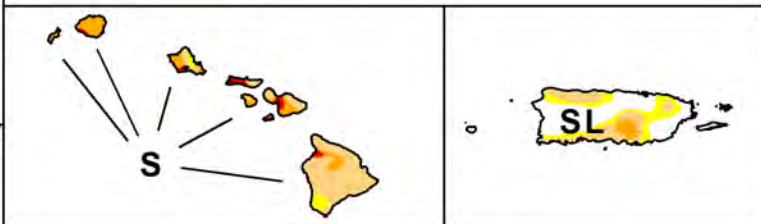
- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought



Author:
Deborah Bathke
National Drought Mitigation Center

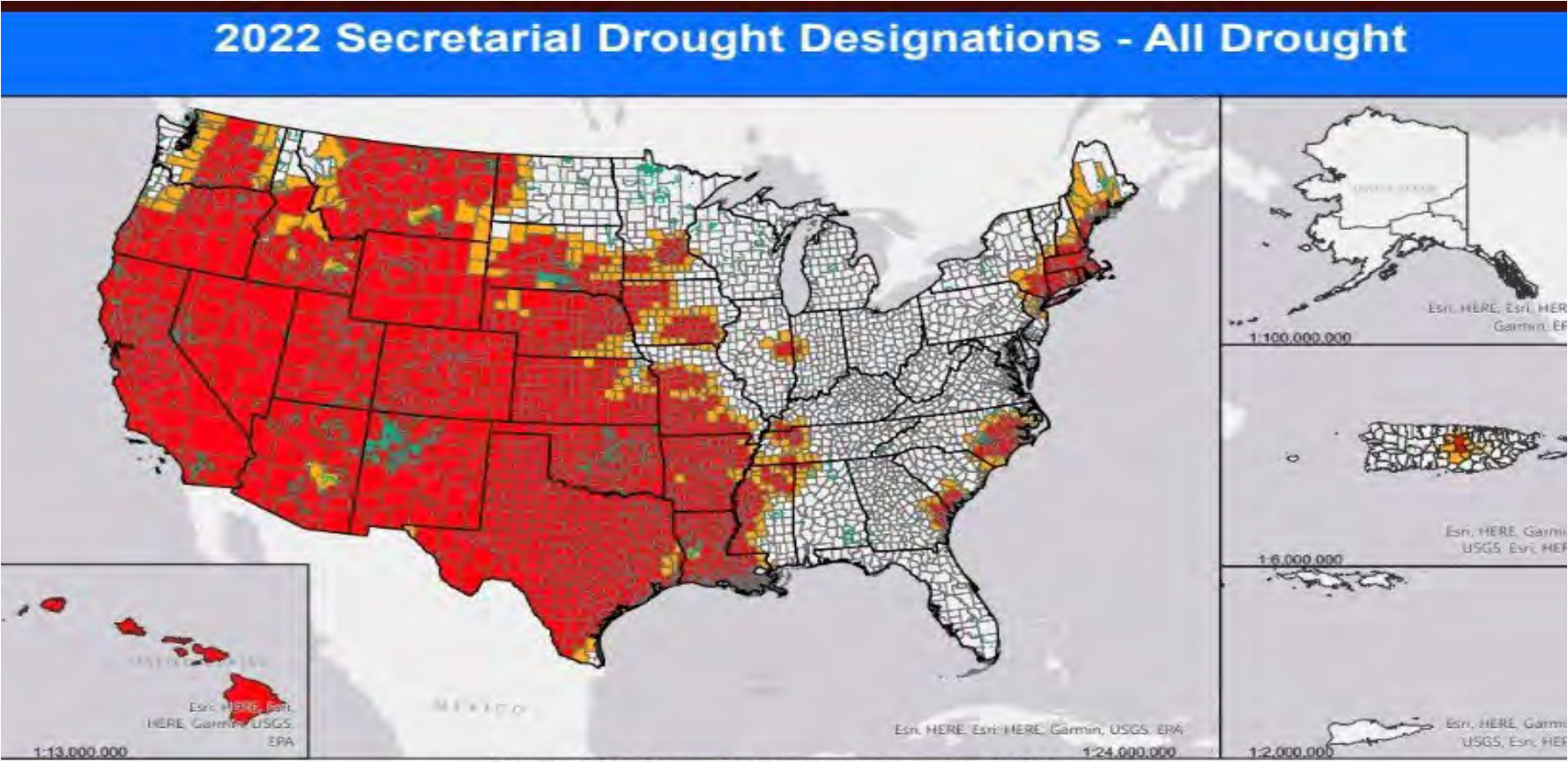


The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>



droughtmonitor.unl.edu

United States Drought 2022



Secretarial Drought Designations for 2022
Disaster Incidences as of October 26, 2022

USDA
United States Department of Agriculture
Farm Service Agency
Program Delivery/Safety Net Division
October 26, 2022

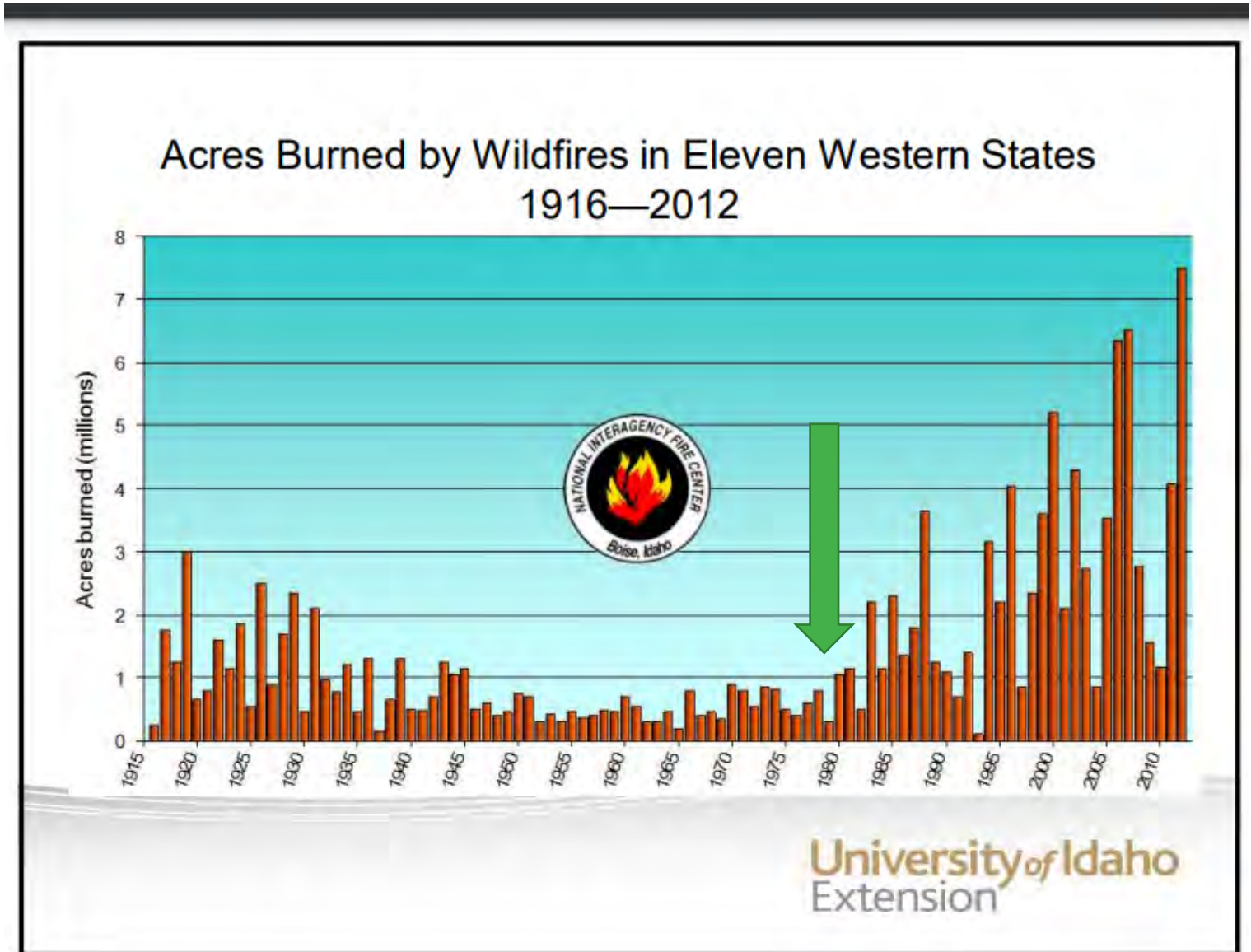
- State Boundary
- County Boundary
- Tribal Lands
- Primary Counties: 1,216
- Contiguous Counties: 338

National Interagency Fire Center – nifc.gov

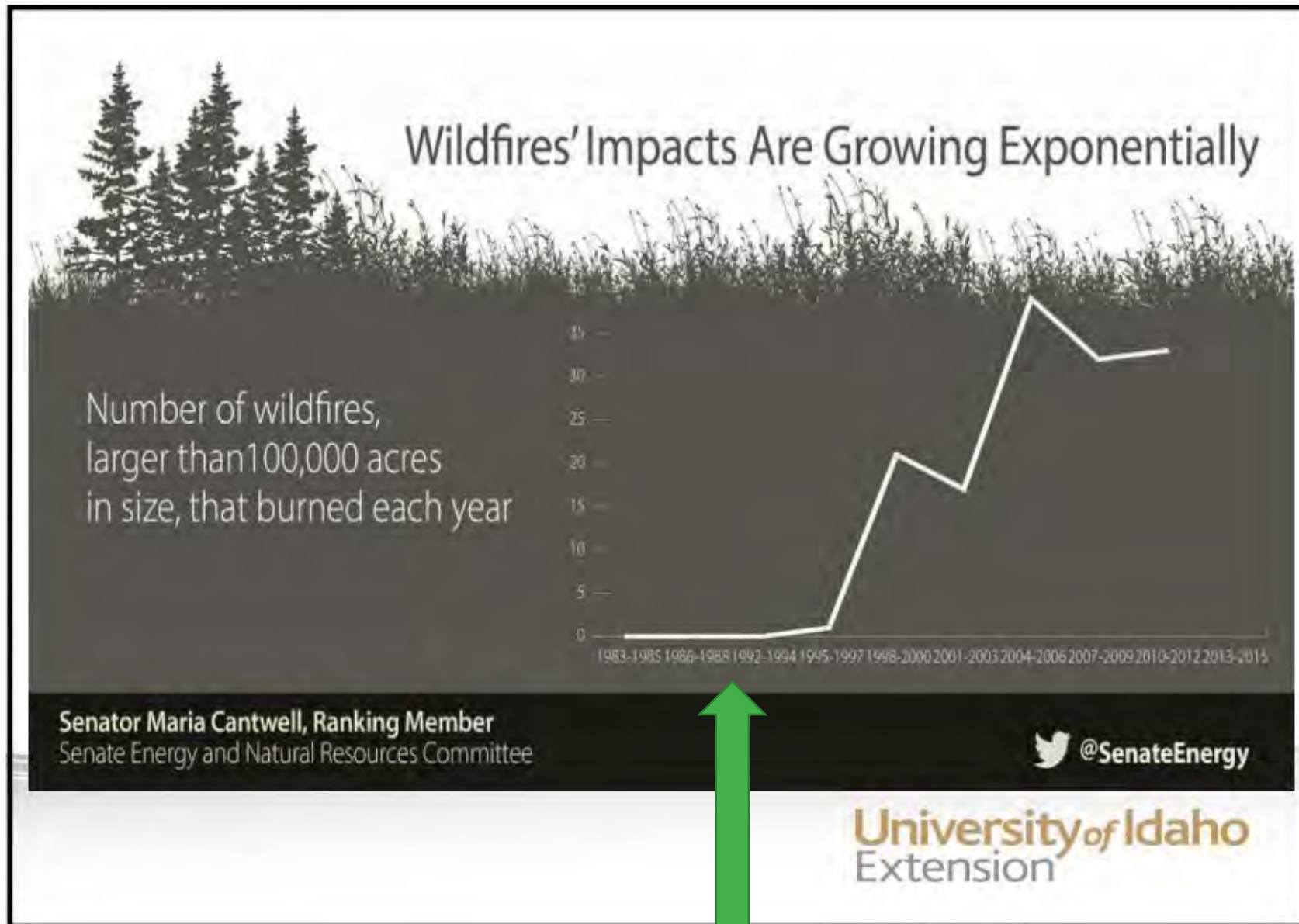


The screenshot shows the homepage of the National Interagency Fire Center website. The header features the NIFC logo on the left, which includes the text "NATIONAL INTERAGENCY FIRE CENTER" and "Boise, Idaho". To the right of the logo is the text "National Interagency Fire Center". Further right are links for "All Social Media" and "Contact Us", a search bar with the placeholder text "Enter keywords ..." and a magnifying glass icon, and a accessibility icon. Below the header is a red navigation bar with the following menu items: "FIRE INFORMATION", "OUR RESOURCES", "STANDARDS", "PROGRAMS", "CAREERS", and "ABOUT US". The main content area features a large background image of a firefighter in a yellow helmet and gear, kneeling in a field of tall grass with a controlled fire burning nearby. Overlaid on the left side of this image is a dark blue box containing the text "Coordination and cooperation in wildland fire management." and a blue button with the text "Learn More >".

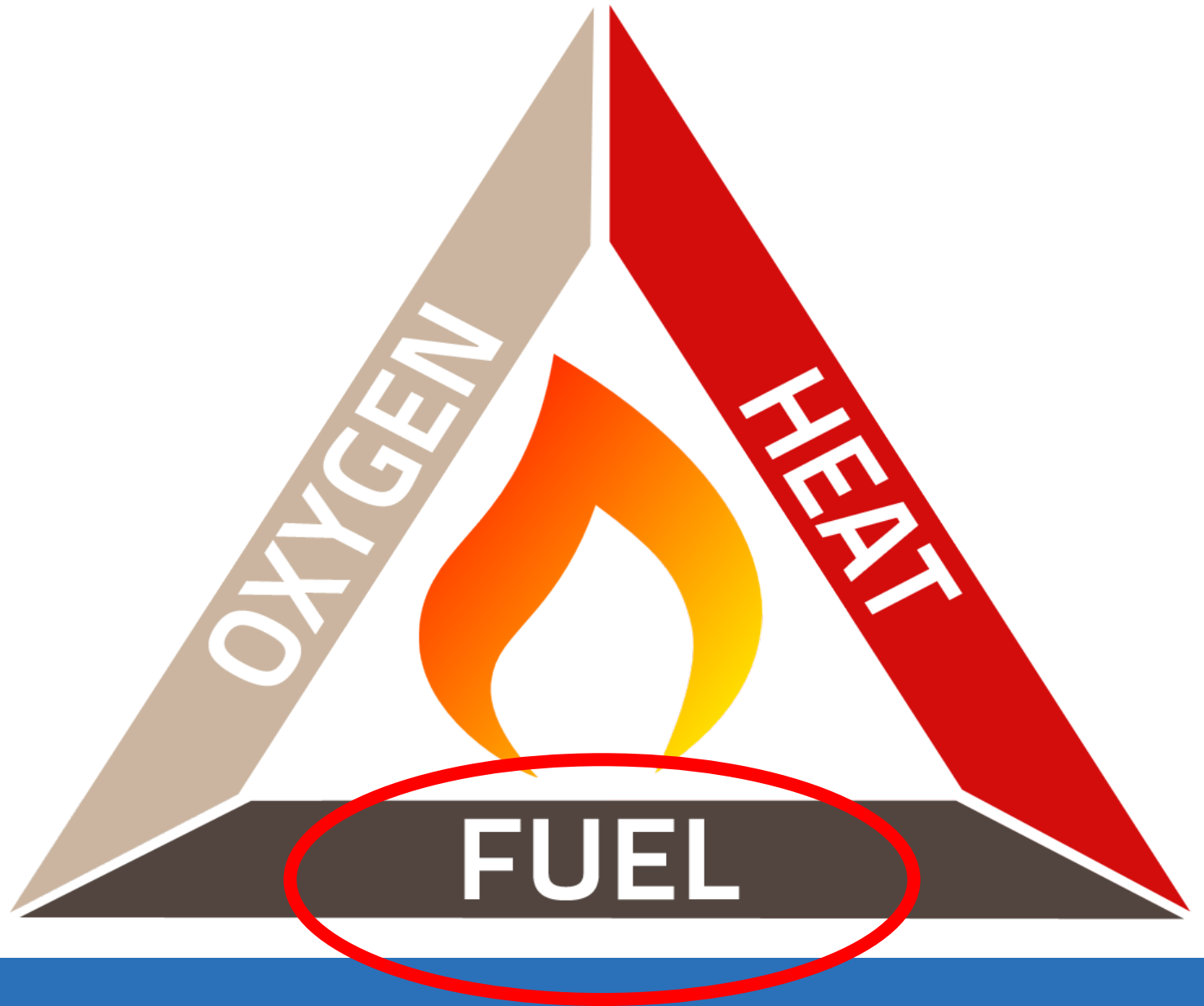
Wildfire Trends



- **Fire Frequency 1983-2015**



Fire Triangle – Which 1 Can We Influence?



Changes In Fuel Load And Fuel Structure

- Drought and heat contribute, but there are more factors.
- Invasive annual grasses behave differently in fire.
- Fire prevention strategies of the past 100+ years have changed the balance.
- Population growth has pushed boundaries of development.
- Post fire, often the first species to grow are fire prone.
- Let's look at a visual demonstration.....

Transition In
Photos -
1909



Same
Location -
1948



Same
Location -
1989



Fuel Breaks And Shaded Fuel Breaks

- Provide firefighters a way to rapidly move through a forest
- Create a potential perimeter to slow down/stop a fire.
- Provide egress for evacuees to escape if roads blocked.
- Once established (either during active fire or prior), fuel breaks must be maintained or they will fill in, often with flammable brush.
- Fuel breaks vs. shaded fuel breaks.

Bridger-Teton National Forest, WY. Sep 6, 2022



Stem Density And Ladder Fuels



Imagine A Grass Fire Caused By Lightning



Fuel Breaks – No Trees Or Brush



Fuel Breaks – Ground Level View



Fuel Breaks – Ground View Maintained With Herbicides



Shaded Fuel Breaks – Lower Stem Density



Shaded Fuel Breaks – Slow Down Fire



Management of Annual Grasses for Wildfire Suppression

Chris McDonald PhD

Natural Resources Advisor

University of California Cooperative Extension

cjmcdonald@ucanr.edu

Southern California

(Riverside, San Diego, Imperial and San Bernardino Counties)

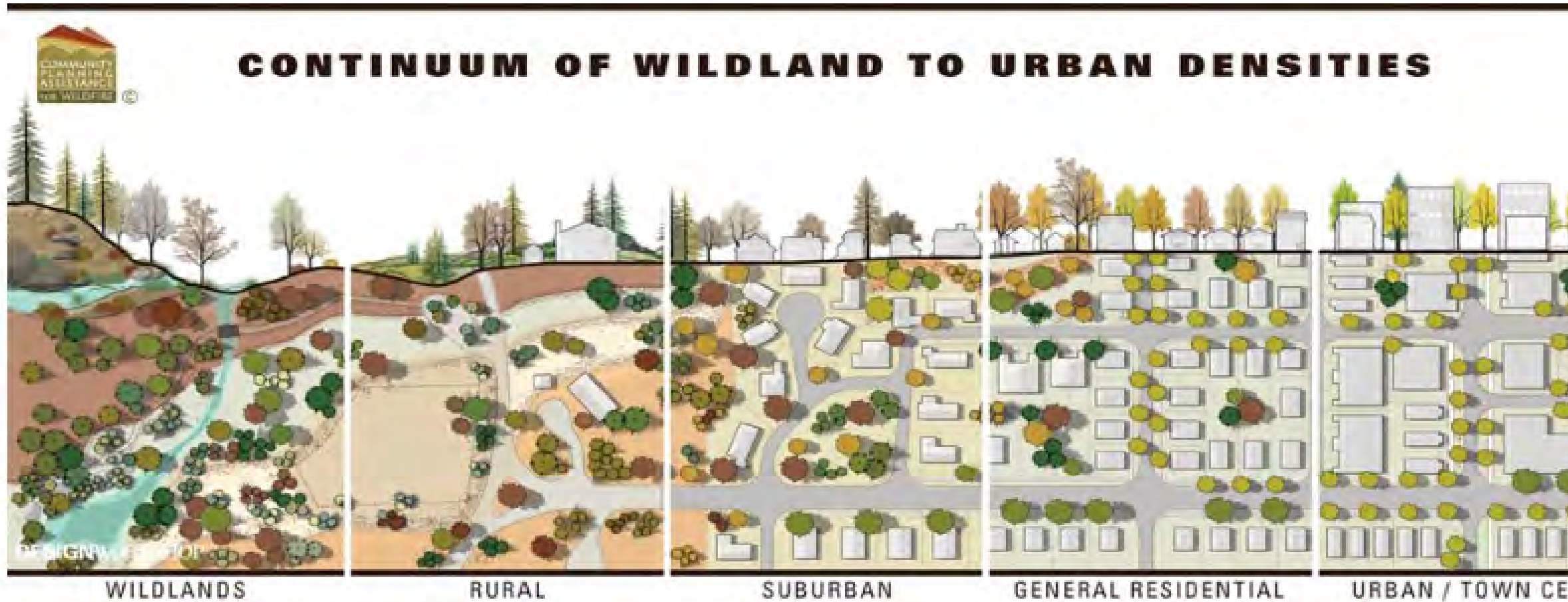
Wildland-Urban Interface (WUI)

- Risk of fire to homes growing across the western US.
- Homes increasingly built close to forests in WUI.
- This makes prescribed burning a difficult management decision.
- Wildland-Urban Interface is transition zone between forests and human development.
- Homes in WUI have a higher fire risk due to proximity to fuel sources such as trees and brush.
- Homes in WUI must take steps to make properties less susceptible to fire, such as 100 - foot defensible space.

This Is Becoming Much Less Common



Wildland-Urban Interface – 44 Million Houses



Problems With Prescribed Burns.....

The screenshot shows the top navigation bar of the Blue Mountain Eagle website with links for News, Elections, Wildfires, Sports, Life, Opinion, Obituaries, e-Edition, Classifieds, and Area Guide. A 'Subscribe Now' button is visible in the top right corner. The main headline is 'Forest Service employee's arrest after fire crosses onto private land sparks larger debate', with a 'BREAKING' tag. The author is identified as Tony Chiotti. Below the headline is a photo of a forest fire. To the right of the photo is a 'Featured Listing' for 'Dayville Cafe in John Day Valley' priced at \$259,000. The Blue Mountain Eagle logo and a 'Subscribe for the best local news' banner are at the bottom of the article.

Fire Every 5 Years Looks Like This



Crown Fire – Complete Devastation



Removal Of Fire From Natural Cycle Results

- Over-crowded stands
- Dense canopies – shade tolerant, less fire-resistant species
- Low burning surface fire turns into high intensity crown fire.
- Recovery time from fire is directly related to forest structure.
- Overcrowding leads to trees that are more susceptible to disease, insects, and other stresses.

Fuel Treatment Strategies

- If forests are overcrowded, need to decrease fuels in all 3 strata.
- Prescribed burning (reduce horizontal fuel continuity), mechanical thinning changes fire.
- Thinning, (either mechanical and/or herbicides) used in conjunction with prescribed burning allows managers to greatly reduce fire intensity and damage.
- Thinning easier on gentler slopes – easier access.
- Important to remove fine fuels after thinning.

National Interagency Fire Center





This

Or This



Herbicides As A Tool In Fire Management

- Part of the total program.
- Different herbicides, different application types – all designed to meet the specific goals of the site.
- How large is the treatment area?
- What species are we trying to manage?
- TVC or spot thinning? Grass safe?
- What is the slope and accessibility of the site?

Site Prep And Conifer Release



Why Is Vegetation Management Important?



Notice How Planted Trees Are Affected By Competition



Without Vegetation Management, Very Poor Stand Establishment



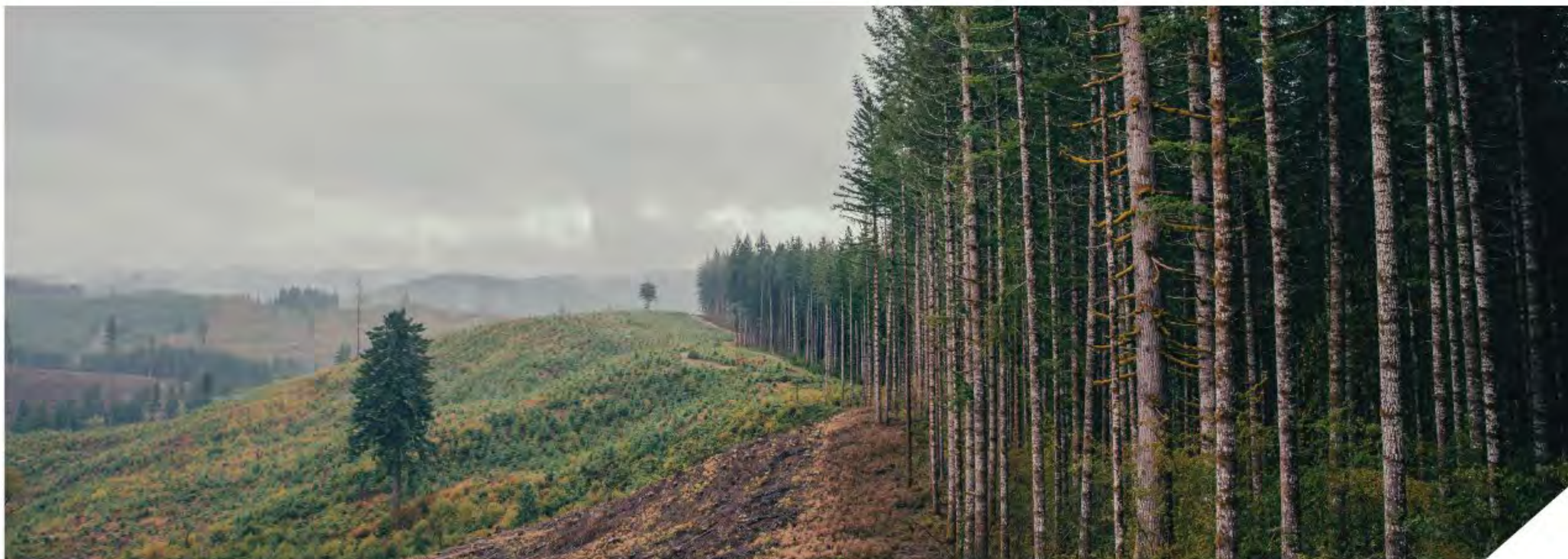
Treated Vs. Untreated



Cleantraxx[®]

HERBICIDE

Conifer Forest and Tree Plantations Use



Visit us at
vegetationmgmt.com

Cleantraxx[®] herbicide is an SC formulation containing:

Penoxsulam – 0.083 lb/gallon, an ALS inhibitor (Group 2) herbicide with broad spectrum weed control.

Oxyfluorfen – 3.96 lb/gallon, a PPO inhibitor (Group 14) herbicide, a long time standard for broad spectrum weed control.

Control

Cleantraxx[®] herbicide controls broadleaf, annual grass weeds and some woody brush seedlings when applied as a **pre or early post** application for conifer **site preparation, conifer release** and forest roadsides.

Selectivity

Excellent conifer tolerance especially on those species that are not tolerant to hexazinone.

Cleantraxx Best Results

Cleantraxx[®]
HERBICIDE

Best results are obtained using Cleantraxx[®] herbicide at 4.5 pints/acre with a rain event within 21 days after application.

- Optimum results using 10 gallons per acre and to areas after burns with little litter and vegetation on the soil.
- Keep product agitated, keep from freezing, and avoid use in temperatures close to freezing.
- **MIX AND SPRAY SAME DAY!**

Benefits

- ✓ Broad Spectrum Weed Control – Over 50 broadleaf and grass species, including **False Dandelion, Woodland Groundsel, and Ceonothus. (SLN)**
- ✓ Burndown and Residual Control – Up to 6 months after the application.

Key species controlled by Cleantraxx[®]

Deerbrush (Ceanothus i)

Prostrate Ceanothus (Ceanothus p.)

Snowbrush (Ceanothus v.)

Common Groundsel (Senecio v.)

False Dandelion

Benefits

- ✓ Conifer Safety – Excellent conifer safety when applied both pre-bud break to early post-bud break.
- ✓ **Douglas-Fir, Ponderosa Pine, Redwoods, and Western Larch** plus hexazinone intolerant species such as **Sugar Pine, Incense Cedar and White Fir.**
- ✓ New trials show good tolerance for other species, as well.

Use Rates

- Use Cleantraxx[®] herbicide at 3 to 4.5 pints/acre in the fall or early spring for pre or early post weed control.
- Typical use rate is 4.5 pints/acre (max annual).
- For effective early post-emergence weed control it is required that a surfactant be added such as MSO or COC at 1 qt/A or NIS at 0.25% v/v .

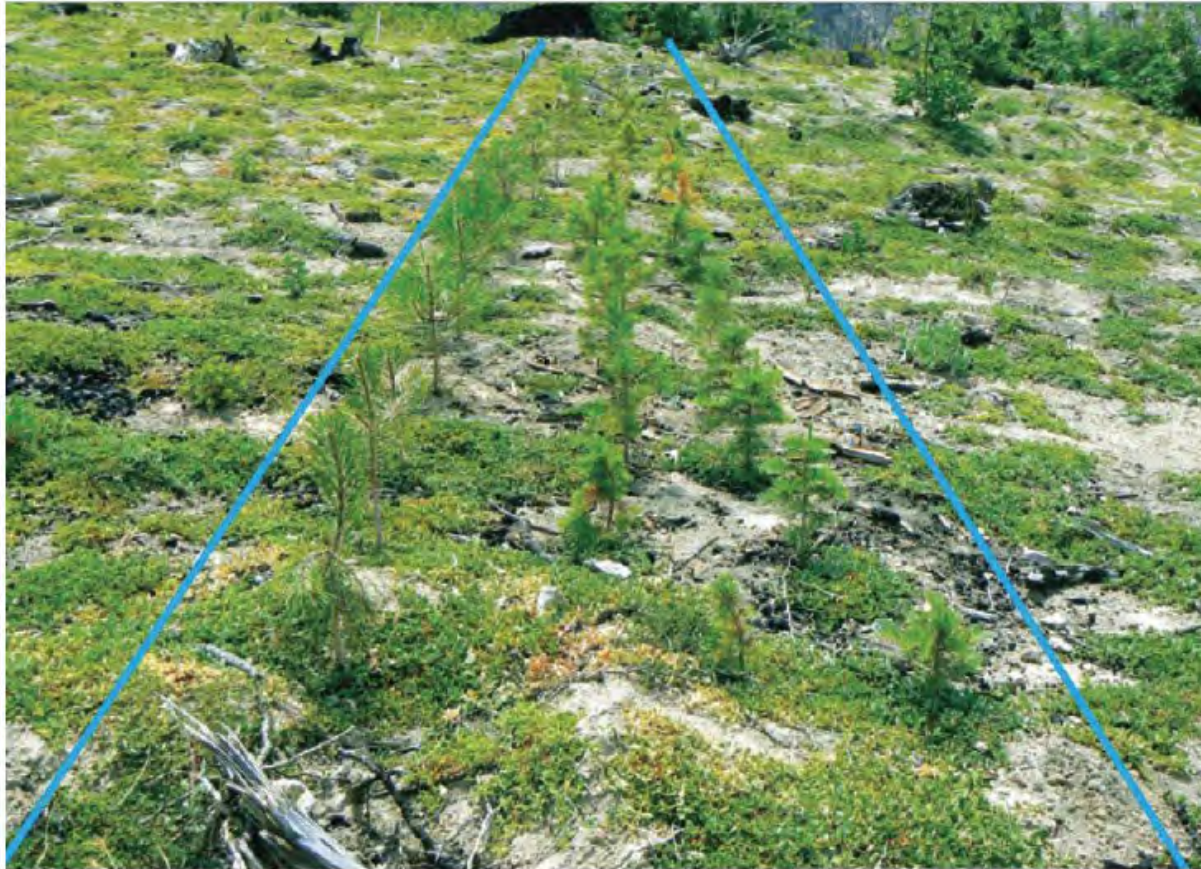
Use Rates

- Organosilicone surfactants are not recommended as they are not effective with Cleantraxx[®].
- For complete control of emerged weeds, mix Cleantraxx[®] with a broad spectrum, postemergence foliar herbicide, such as Transline[®] or Accord[®] XRT II (glyphosate).

Sec 24c SLN

- Labeled for forestry use as a Special Local Needs (SLN) label.
 - ✓ OR
 - ✓ WA
 - ✓ CA
 - ✓ ID

*Prostrate Ceanothus control with Cleantraxx® at 3 pints/acre applied pre-emergence in spring
(Photo taken approximately 1-YR after treatment)*



Snowbrush Ceanothus seedling control approximately 2 years after fall application with Cleantraxx[®] + Milestone[®] at 3 pt + 7 fl oz/A



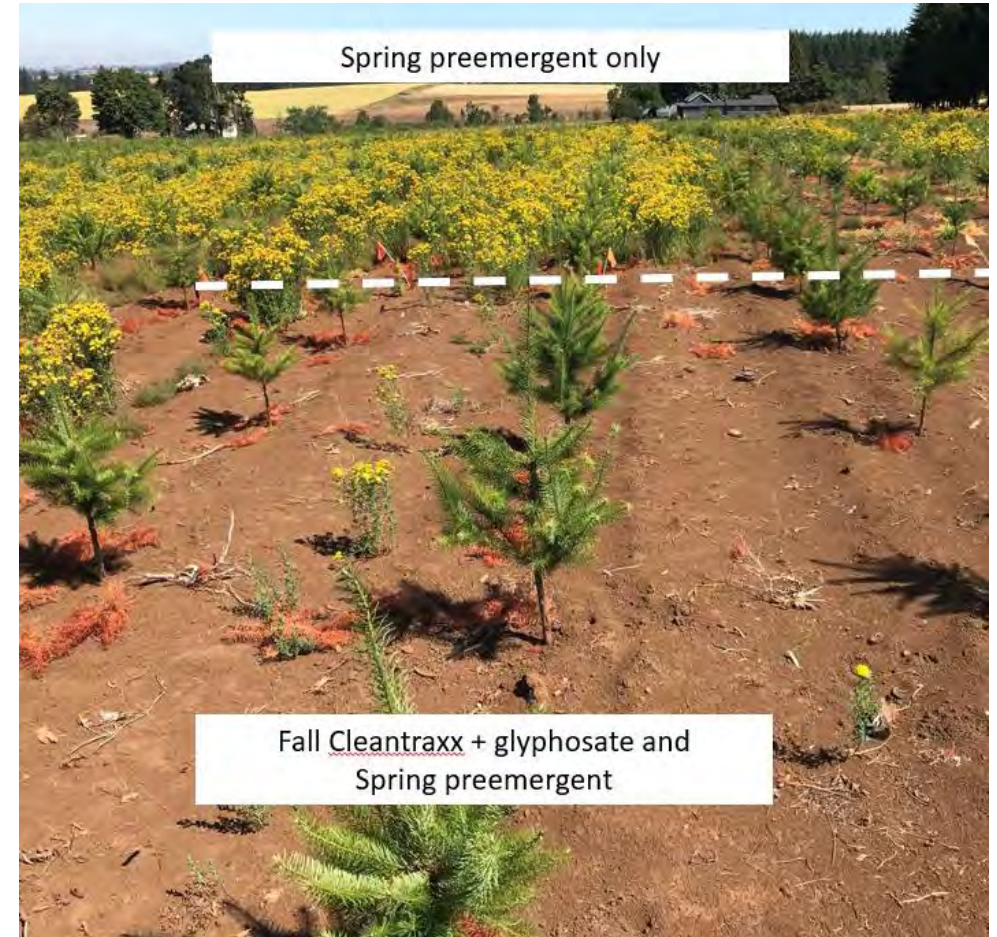
*Incense Cedar, Sugar Pine, and Ponderosa Pine at 1 year after treatment with Cleantraxx® at 3 pints/acre + NIS at 0.25% v/v applied post bud break (2-3 inches of new growth).
No herbicide symptoms observed, trees growing normally*



Christmas Trees

- Current SLNs for Forestry
 - ✓ WA – SLN
 - OR – SLN “Not for use in Christmas tree plantations or in ornamental plantings”
 - Expected OR SLN very soon!
- 2021 OR Field trials
 - Cleantraxx @ 3 and 4.5 pt/ac
 - Determine crop safety of Cleantraxx over top of newly planted and 2nd year Christmas trees (various species) to support 24c registration in Oregon

1-Yr Doug Fir Fall Applied (Oct)
Cleantraxx + glyphosate
St. John's Wort, wild carrot, Canada thistle, and Common Catsear



*2-Yr Nordmann Fir Spring Applied (Mar)
92 DAA
Wild Carrot, grasses, other broadleaves*



Transline[®]

HERBICIDE

The Advantage of Transline[®] Herbicide



Visit us at
vegetationmgmt.com

Transline[®] herbicide is an SC formulation containing:

Clopyralid – 3 lb/gallon, an Auxin (Group 4) herbicide with broad spectrum weed control.

Control & Selectivity

Transline[®] herbicide controls broadleaf weeds and certain woody plants with excellent selectivity, allowing for use **over the top of many conifers and hardwood species.**

Residual

Transline[®] provides excellent residual control of **kudzu**, and many tough, Western invasive weeds, like **knapweeds** and **thistles** in conifer and hardwood forest settings (including Christmas Trees).

Transline Best Results

Best results are obtained using Transline[®] herbicide at 12-20 oz/A.

- Apply when weeds are small and actively growing.
 - Thistles: Apply from rosette to before flower
 - Canada Thistle: Apply during fall regrowth or during bolting to early bud stage
 - Spotted Knapweed: Apply at rosette to mid-bolting or fall regrowth.
 - Russian Knapweed: Apply from bud to mid-flower or on dormant plants in the fall.
- Optimum results may be obtained using 5+ gallons per acre and applications to areas after burns with little litter and vegetation on the soil.

Benefits

- ✓ Conifer Safety – Excellent conifer safety when applied anytime during the season.
 - Some needle/leaf curling may occur if applied during active tree growth.
 - This effect is transient and trees should recover by the end of the same growing season or early the following growing season.

Benefits

✓ Examples of Tolerant Tree Species

Alder	Green Ash	Russian Olive
Balsam Fir	Hackberry	Sawtooth Oak
Black Walnut	Hickory	Scotch Pine
Blue Spruce	Hybrid Aspen	Slash Pine
Bur Oak	Hybrid Poplar	Shortleaf Pine
Cherry	Incense Cedar	Sugar Maple
Cherry Bark Oak	Loblolly Pine	Sumac
Choke Cherry	Lodgepole Pine	Sycamore
Cottonwood	Longleaf Pine	Western Red Cedar
Crabapple	Noble Fir	Western Hemlock
Douglas-Fir	Norway Spruce	White Ash
Eastern Red Cedar	Pacific Silver Fir	White Pine
European Larch	Ponderosa Pine	White Spruce
Fraser Fir	Red Oak	White Oak
Grand Fir	Red Pine	

Benefits

- ✓ Broad Spectrum Weed Control – Over 50 broadleaf weeds and woody brush species, including Kudzu, Knapweeds, and Thistles
- ✓ Site Prep or Release
- ✓ Excellent residual control and is rainfast within 2 hours

Transline[®] Conifer Release 16 oz/A Over Growing Conifers



Opensight®

Opensight®
HERBICIDE

- Water Dispersible Granule (WDG)
 - Aminopyralid + Metsulfuron Methyl
 - Auxin (Group 4) + ALS (Group 2)
 - Pre and Post-emergent activity
- Control over 170 broadleaf weeds and woody plants.
- Use Rate: 2 – 3.3 oz/A
- **The broadest spectrum forestry weed and brush herbicide available in one container.**

Opensight®

- 24c SLN – For control of Scotch Broom, Thistles, Hawkweed and other weeds in Forest Plantations.
 - ✓ ID
 - ✓ WA
 - ✓ OR
- **Forest Site Prep** and Directed / Spot Spray
 - Avoid spray contact with foliage and root zone.
 - Conifers planted sooner than 4 months (East of Cascades) or 2 months (West of Cascades) after treatment may be injured.

Garlon® XRT

- 6.3 lb/gal Triclopyr Ester
- Solvent free, Lower odor
- Emulsifiable Concentrate (EC)
- High load formulation = less product handling

- Control over 100 species of woody plants, deciduous trees, shrubs, and broadleaf weeds.

- Use Rate: $\frac{3}{4}$ – 5 qt/A



Vastlan[®]

HERBICIDE

Freelexx[®]

HERBICIDE



Vegetation Management

Visit us at
vegetationmgmt.com

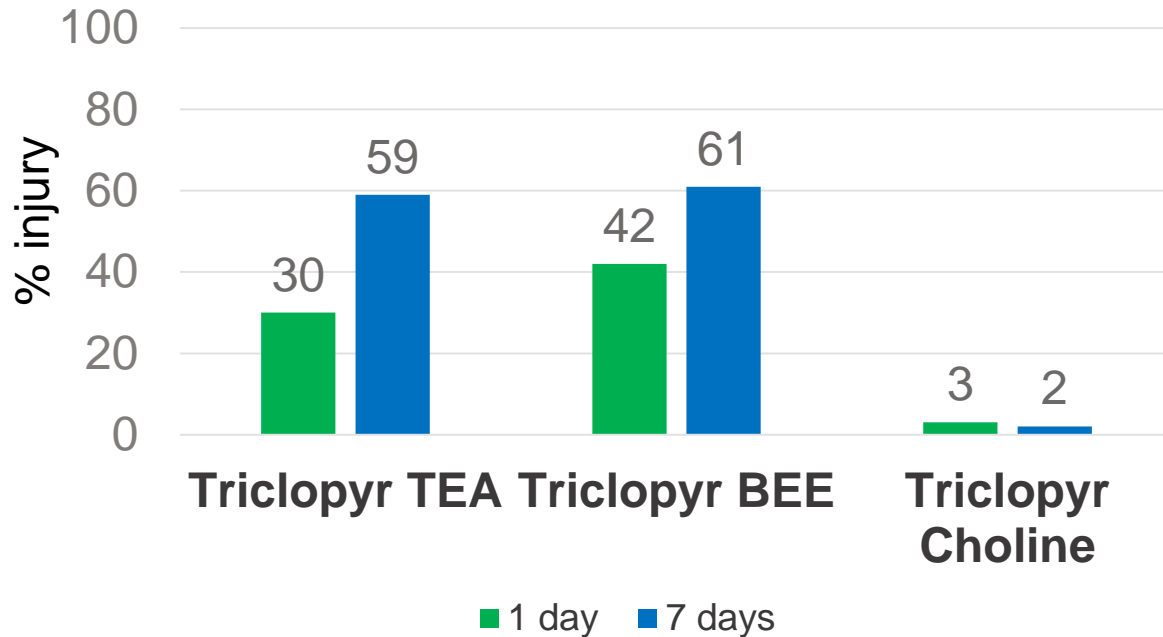
Choline Technology

- New and innovative formulation technology
- Unlike traditional 2,4-D and triclopyr products
- **Near Zero Volatility and reduced odor**
 - > Reduced odor due to lower level of phenols used in production
 - > Reduced “visibility” of applications
- Improved **non-flammable formulation**
- Same exceptional weed control
- Same environmentally favorable profiles

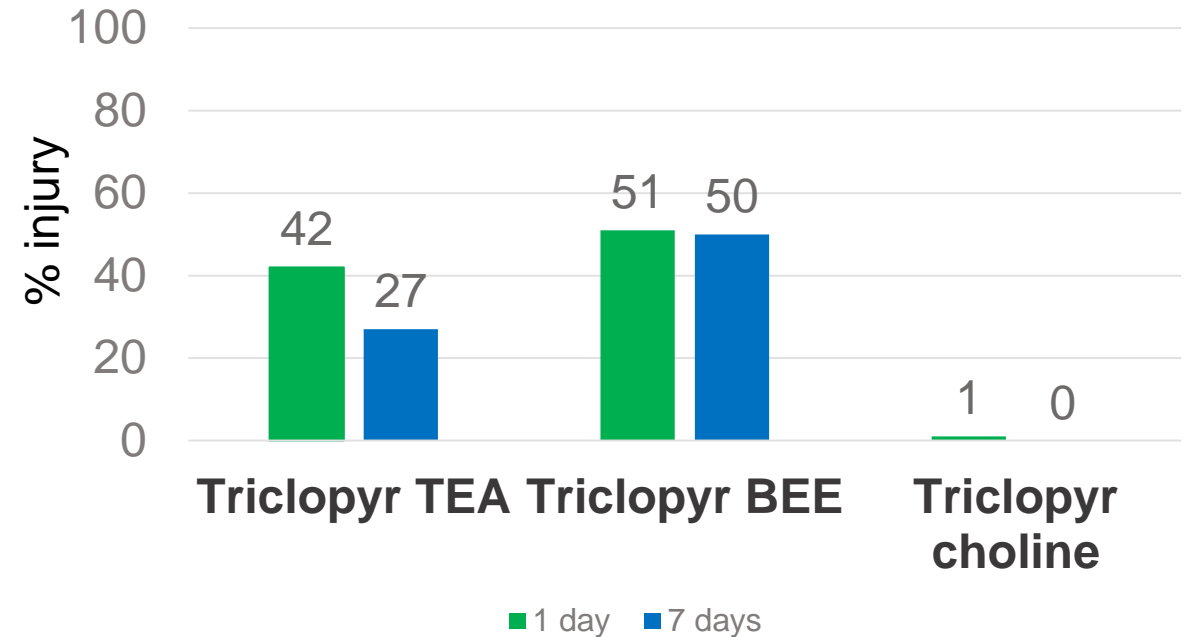


Greenhouse Volatility Test

Symptoms on grapes at 1 and 7 days after exposure to vapor at 104F



Symptoms on tomatoes at 1 and 7 days after exposure to vapor to 104F



* triclopyr BEE (64 fl oz/A of a 4 lb ae/gallon product)
* triclopyr TEA (86 fl oz.A of a 3 lb ae/gallon product)
* triclopyr choline (64 fl oz/A of a 4 lb ae/gallon product)

Greenhouse Volatility Test

Triclopyr BEE Nontreated



Triclopyr TEA Nontreated



Triclopyr Choline Nontreated



Triclopyr BEE Nontreated



Triclopyr TEA Nontreated



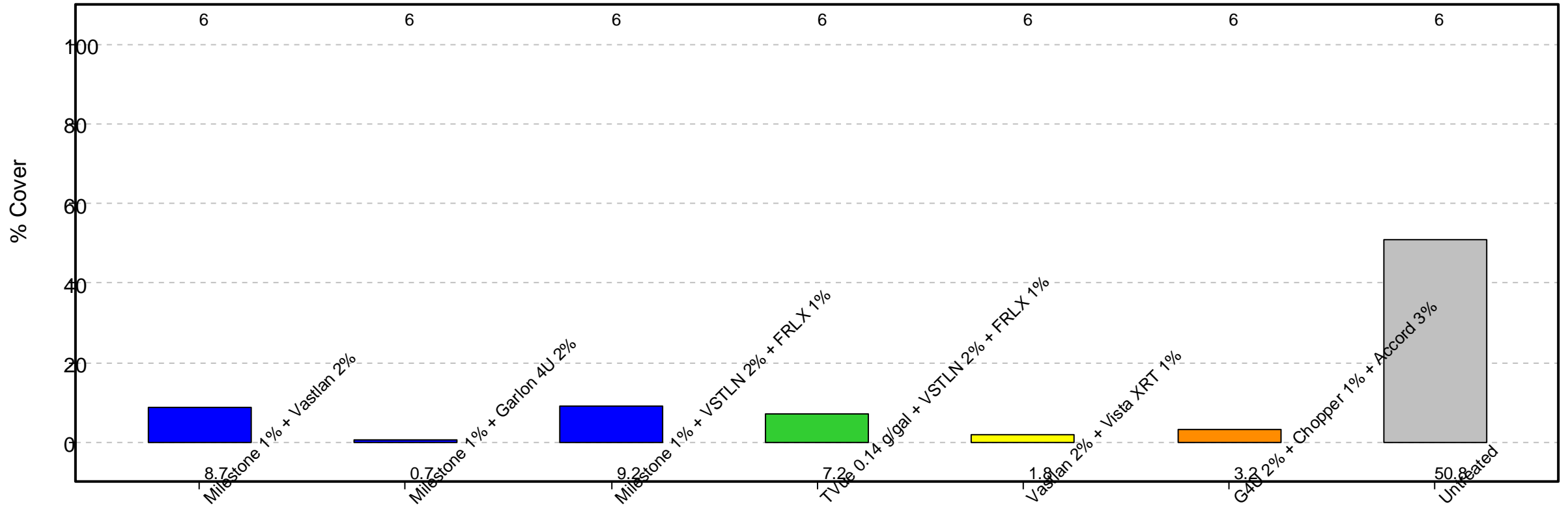
Triclopyr Choline Nontreated



2022 Forestry Shaded Fuel Break Trials

Woody plants % COVER - 18 to 26 WAA

Mean values below box. Number of observations above box



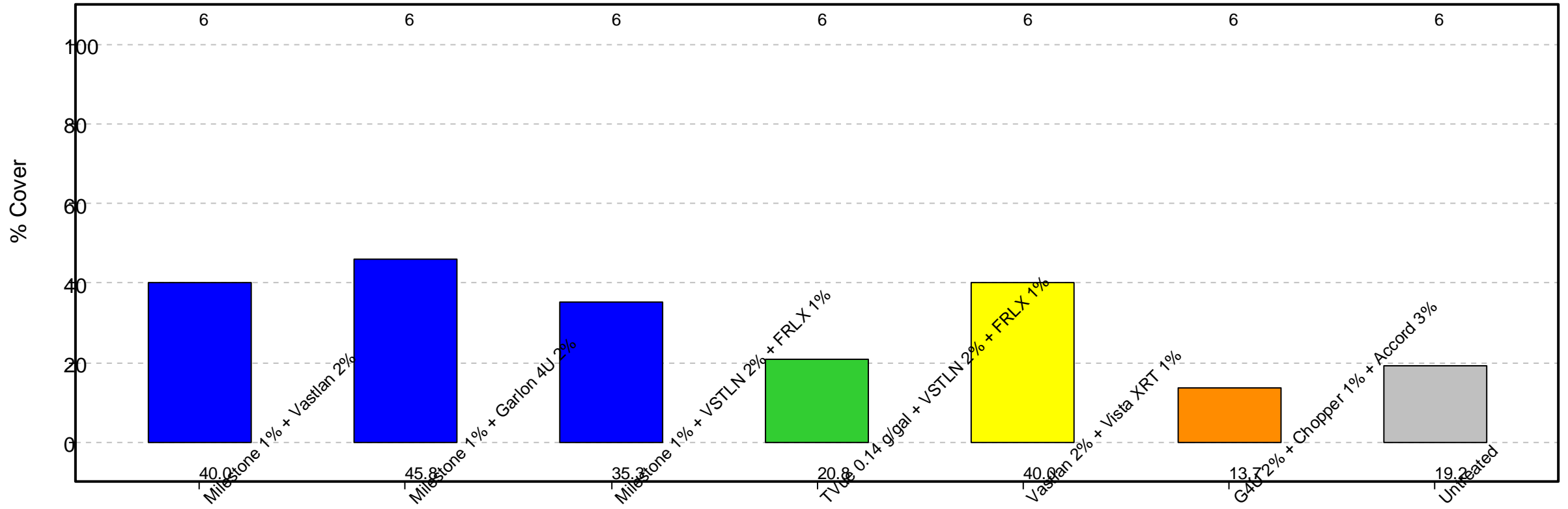
All with MSO 2% v/v

Treatment

2022 Forestry Shaded Fuel Break Trials

Herbaceous plants % COVER - 18 to 26 WAA

Mean values below box. Number of observations above box



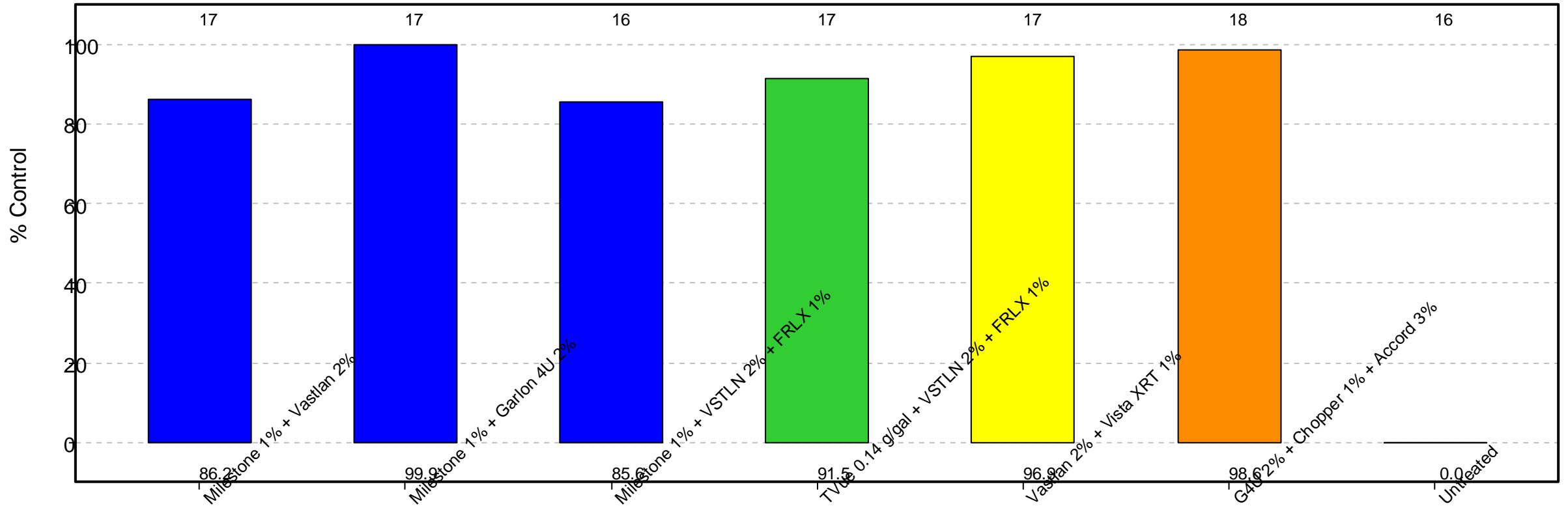
All with MSO 2% v/v

Treatment

2022 Forestry Shaded Fuel Break Trials

% CONTROL Across all Woody Plants - 18 to 26 WAA

Mean values below box. Number of observations above box



All with MSO 2% v/v

Treatment

Vegetationmgmt.com/fire-prevention



THANK YOU!

 Corteva U.S. Vegetation Management



Visit us at vegetationmgmt.com

®.™Trademarks of Dow AgroSciences, DuPont or Pioneer, and their affiliated companies or their respective owners.

Under normal field conditions DuraCor® and TerraVue™ are non-volatile. DuraCor and TerraVue have no grazing or haying restrictions for any class of livestock, including lactating dairy cows, horses (including lactating mares) and meat animals prior to slaughter. Label precautions apply to forage treated with

DuraCor and TerraVue to manure and urine from animals that have consumed treated forage.

State restrictions on the sale and use of Accord XRT II apply. When treating areas in and around roadside or utility rights-of-way that are or will be grazed, hayed or planted to forage, important label precautions apply regarding harvesting hay from treated sites, using manure from animals grazing on treated areas or rotating the treated area to sensitive crops. See the product label for details.

State restrictions on the sale and use of Capstone, Garlon 4 Ultra, Milestone, Spike 80DF and Transline apply. Graslan and Tordon 22K are federally Restricted Use Pesticides. See the product label for details. DuraCor, Freelexx, Opensight, Vastlan and Cleantraxx are not registered for sale or use in all states. Contact your state pesticide regulatory agency to determine if a product is registered for sale or use in your state. Spike 80DF is registered for range and pasture use only in AL, KS, LA, MO, MS, NM, OK and TX. Consult the label before purchase or use for full details. TerraVue has not yet received 19 regulatory approvals; approvals are pending. The information presented here is not an offer for sale.

Always read and follow label directions. ©2020 Corteva