WESTERN REGIONAL & SAFETY SUMMIT 2026

November 3rd

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Wildfire Presentation

Presented by:

Deputy Chief Fairbanks and
Battalion Chief O’Neil of CAL FIRE

Utility Wildfire Mitigation Program



Discussion Topics

- State Responsibility Area
- Electrical power stats and trends
- Ignition drivers
- Grid Hardening
- Public Resources Codes (PRC) 4292 and 4293
- Powerline Fire Prevention Field Guide and Pocket Guide

CAL FIRE

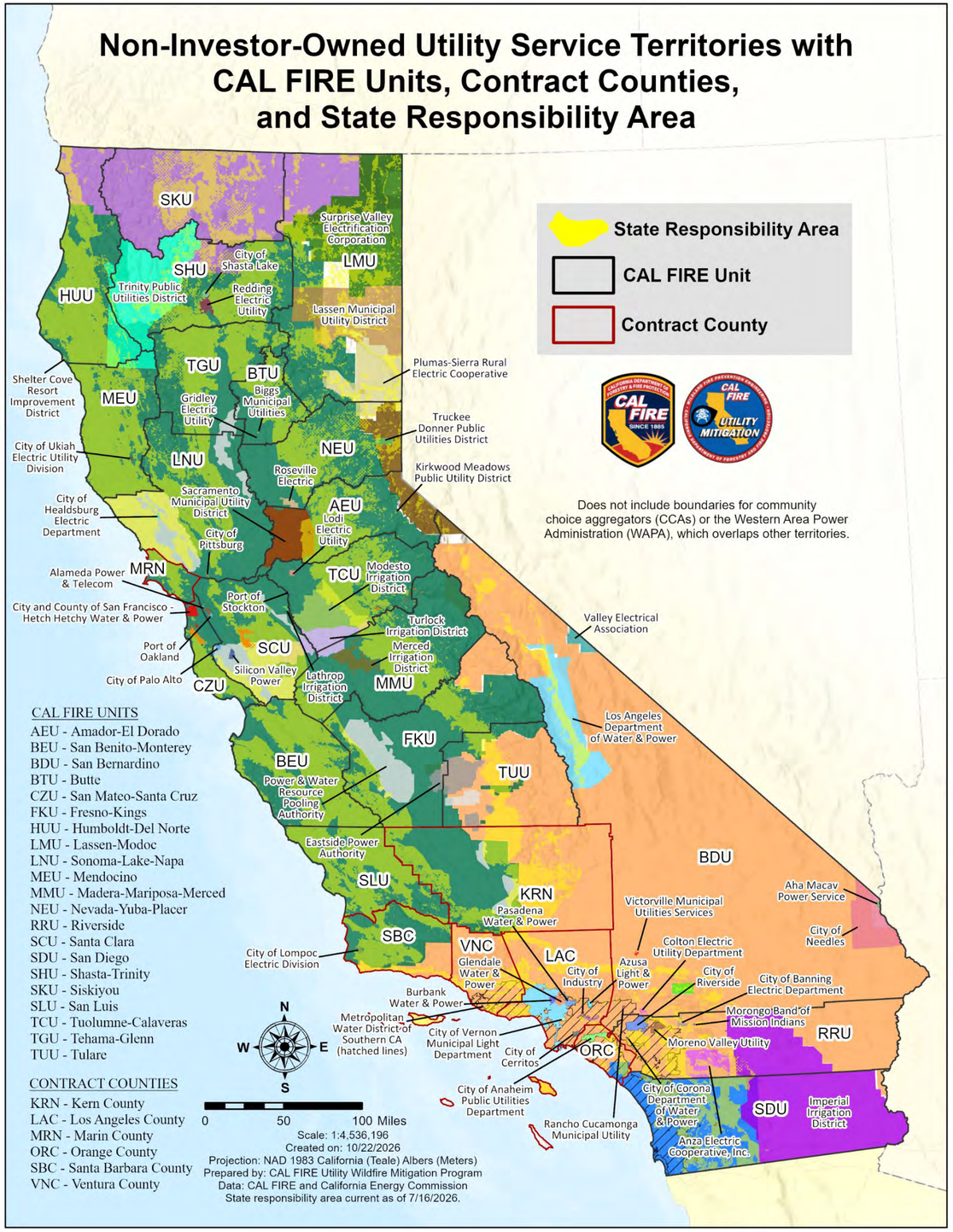
In State Responsibility Area

Investor-Owned Utilities

- Pacific Gas and Electric (PG&E)
- Southern California Edison (SCE)
- San Diego Gas & Electric (SDG&E)
- PacifiCorp
- Bear Valley Electric Service, Inc.
- Liberty Utilities

Publicly Owned/Cooperative Utilities

- 30+ Utilities



Electrical Power Cause - Statistics

On average, 10% of wildland fires in State Responsibility Area are electrical power-Caused*





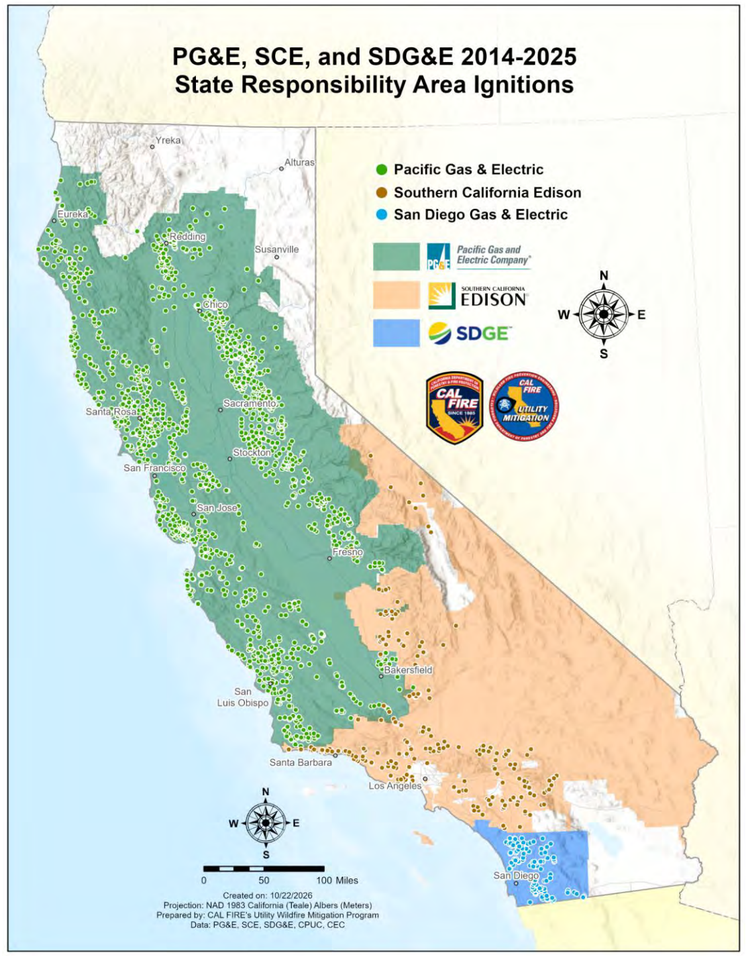


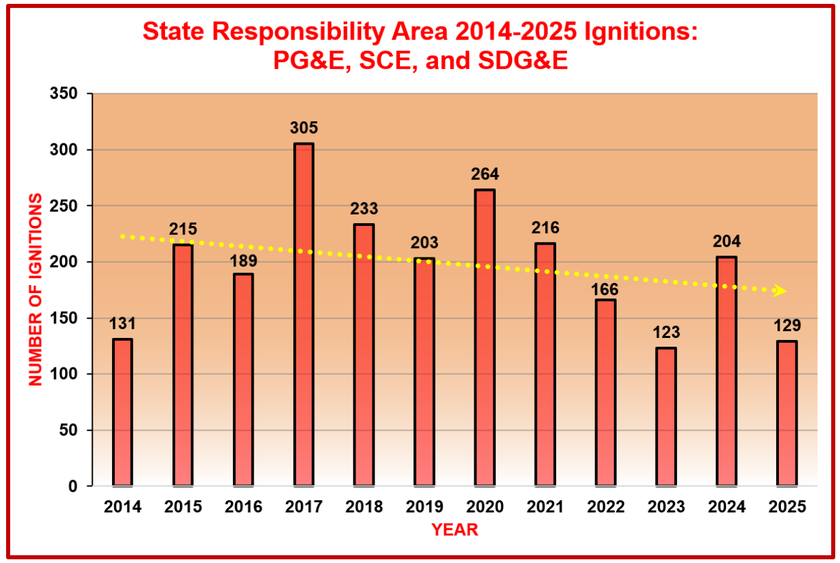
- 7 of the Top 20 Destructive California Wildfires
- 3 of the Top 20 Largest California Wildfires
- 5 of the top 20 Deadliest California Wildfires

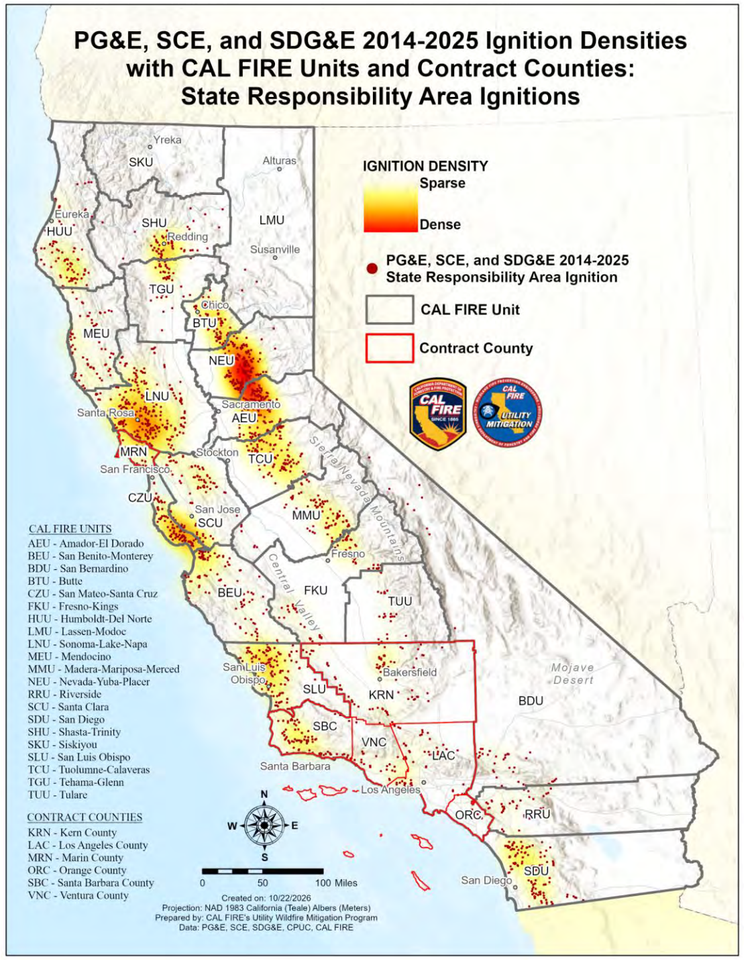




* Based on 9-year average from CAL FIRE Redbook 2014 - 2022



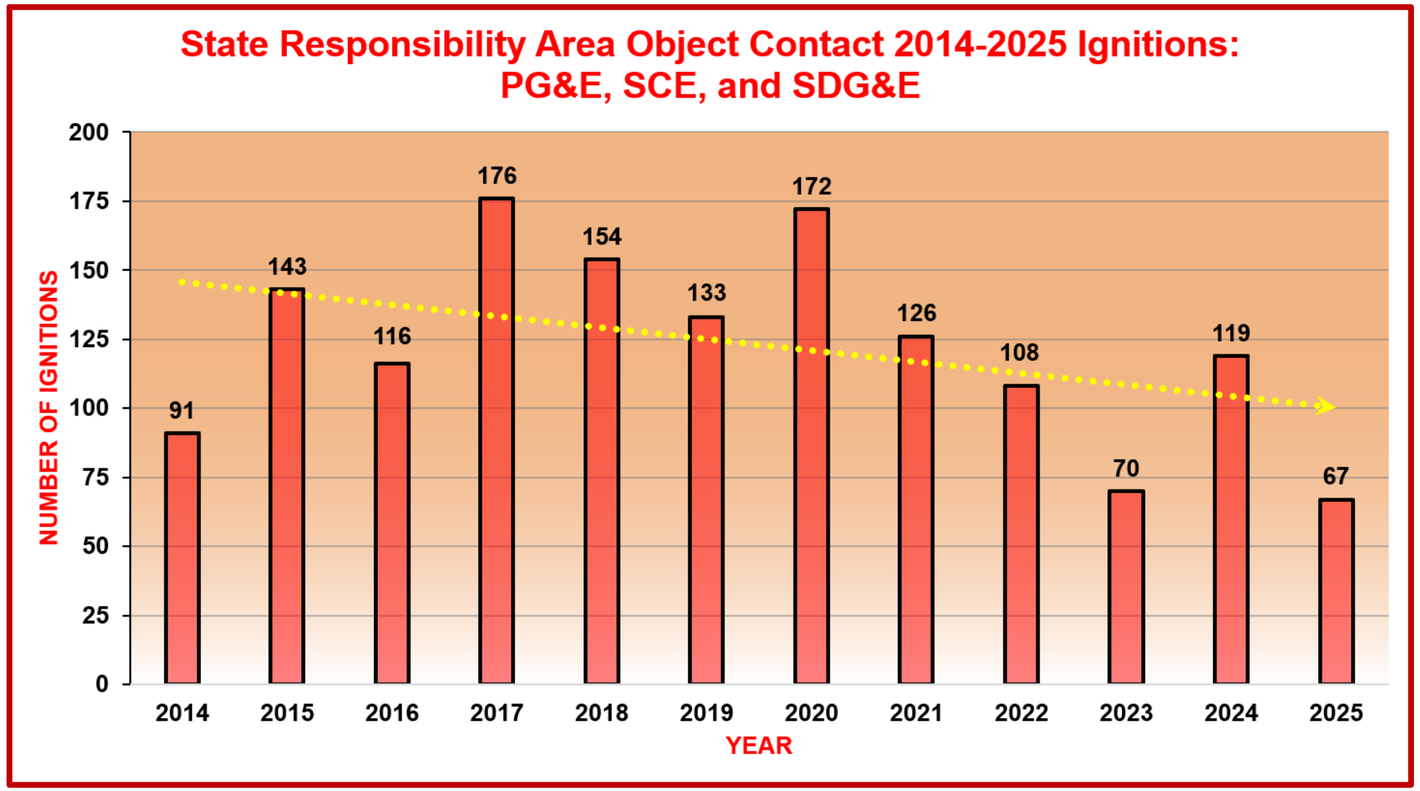




PG&E, SCE, and SDG&E
2014-2025 State Responsibility Area (SRA) Ignitions

2014-2025 ignitions numbers in this PowerPoint are from annual ignitions data utilities submitted to the California Public Utilities Commission.

Object Contact: Highest PG&E, SCE, and SDG&E SRA Ignition Cause from 2014-2025



2014-2025 ignition numbers in this PowerPoint are from annual ignitions data utilities submitted to the California Public Utilities Commission.

From 2014 to 2025, approximately 62% of SRA PG&E, SCE, and SDG&E-related ignitions were caused by object contact. Below are the top object contact causes with % they represent of total SRA 2014-2025 ignitions from these utilities:

- Vegetation: 34%
- Animal: 13%
- Vehicle: 9%
- Balloon: 3%

VEGETATION CONTACT

Vegetation contacting power lines or other equipment.



Tree across powerlines



Branches across powerlines

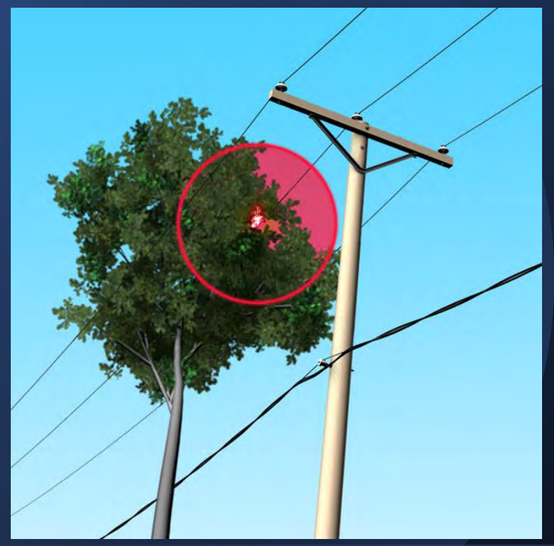






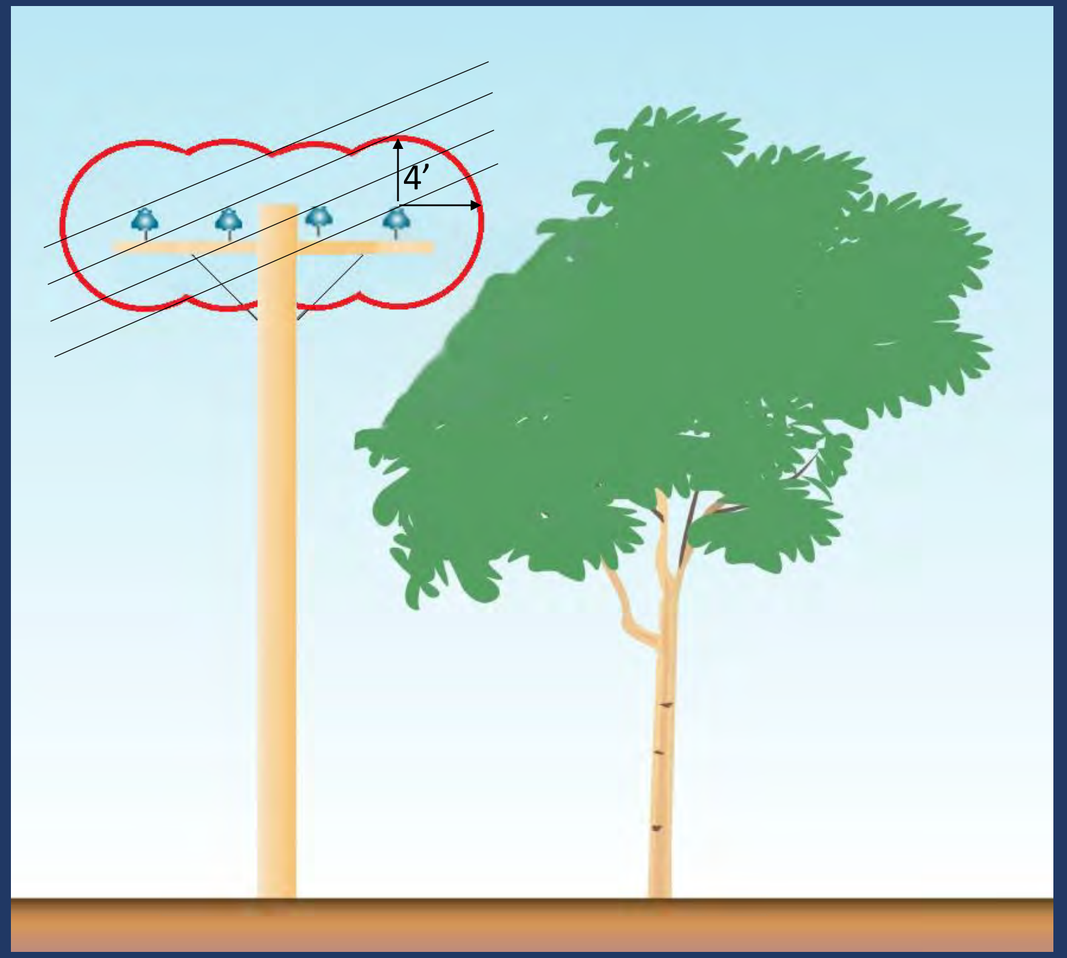
Public Resources Code (PRC) 4293

Minimum Conductor Clearances

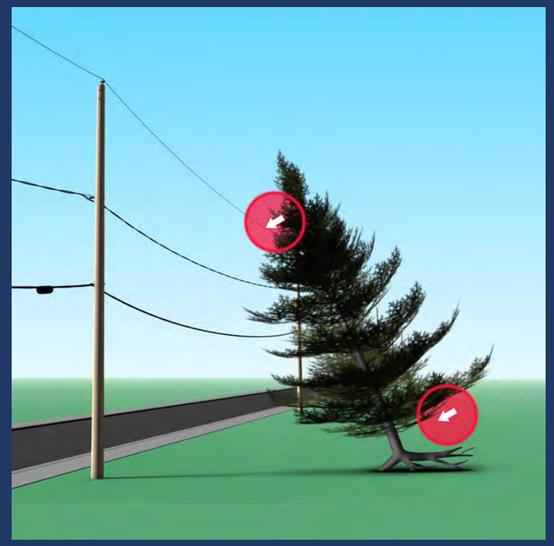


Voltage-based

- 4 Feet . . . . . 2.4 - 72 kV
- 6 Feet . . . . . 72 - 110 kV
- 10 Feet. . . . . Over 110 kV



Also includes Hazard Tree Removals



Dead trees, old decadent or rotten trees, trees weakened by decay or disease and trees or portions thereof that are leaning toward the line which may contact the line from the side or may fall on the line shall be felled, cut, or trimmed so as to remove such hazard.

Tree Hazards

Non-exhaustive list of tree defects



Insect Infestation



Conks



Canker



Cat Face



Open Wounds



Codominant Tops



Cracks



Shallow Roots

ANIMAL CONTACT

Animal, animal nests, bird droppings on electrical equipment.





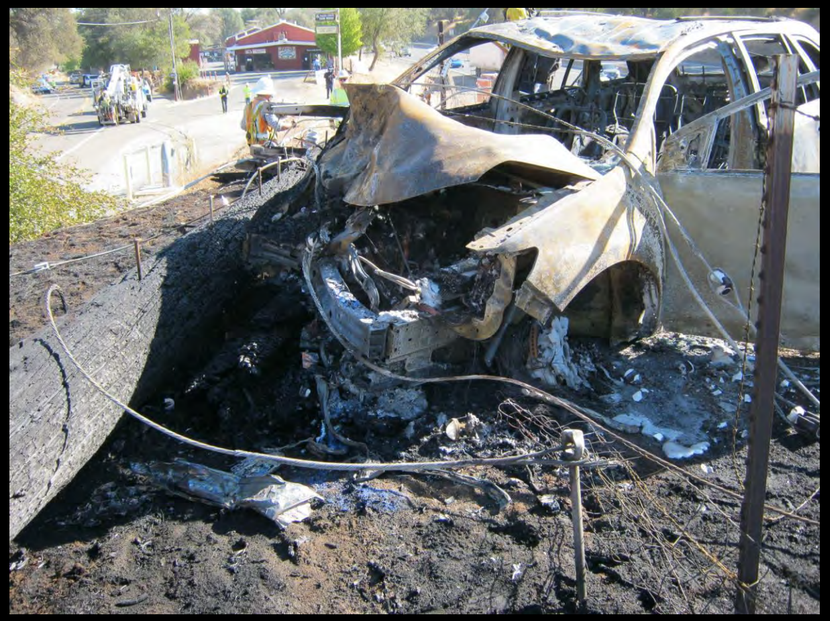




VEHICLE CONTACT

Vehicle hitting a power pole or other asset.









BALLOON CONTACT

Mylar balloon contacting power lines or other equipment.









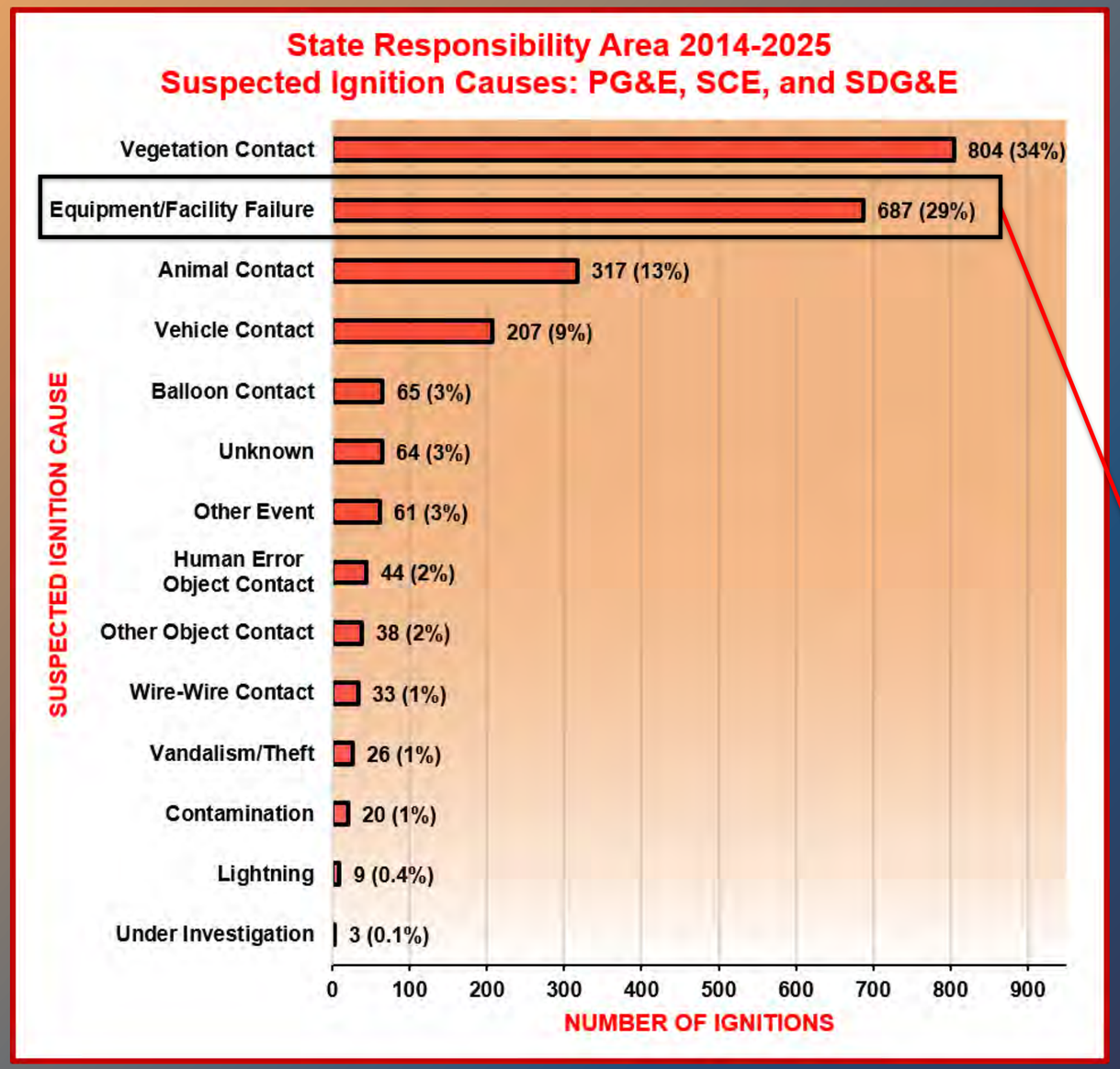
Grid Hardening

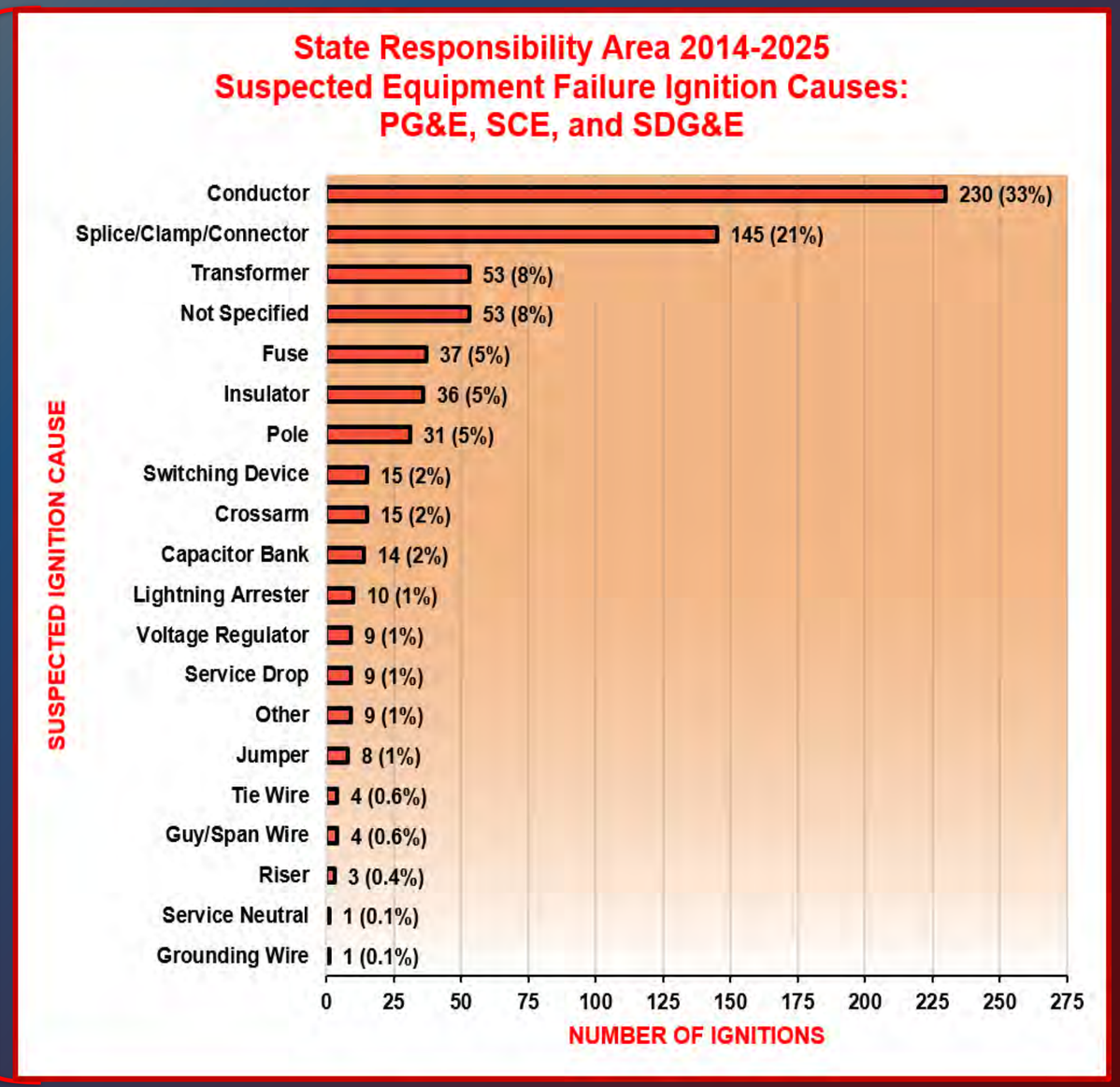
- Undergrounding
- Covered Conductor
- Composite Crossarms
- Wildlife Coverings
- Jumper Coverings
- Using equipment that does not create arc or sparks under normal operation.
- Fire-Resistive Poles (Steel, Composite, Wood wrapped in fire resistant wrapping.
- New Emerging Technologies





Breakdown of PG&E, SCE, and SDG&E SRA Ignitions: 2014-2025





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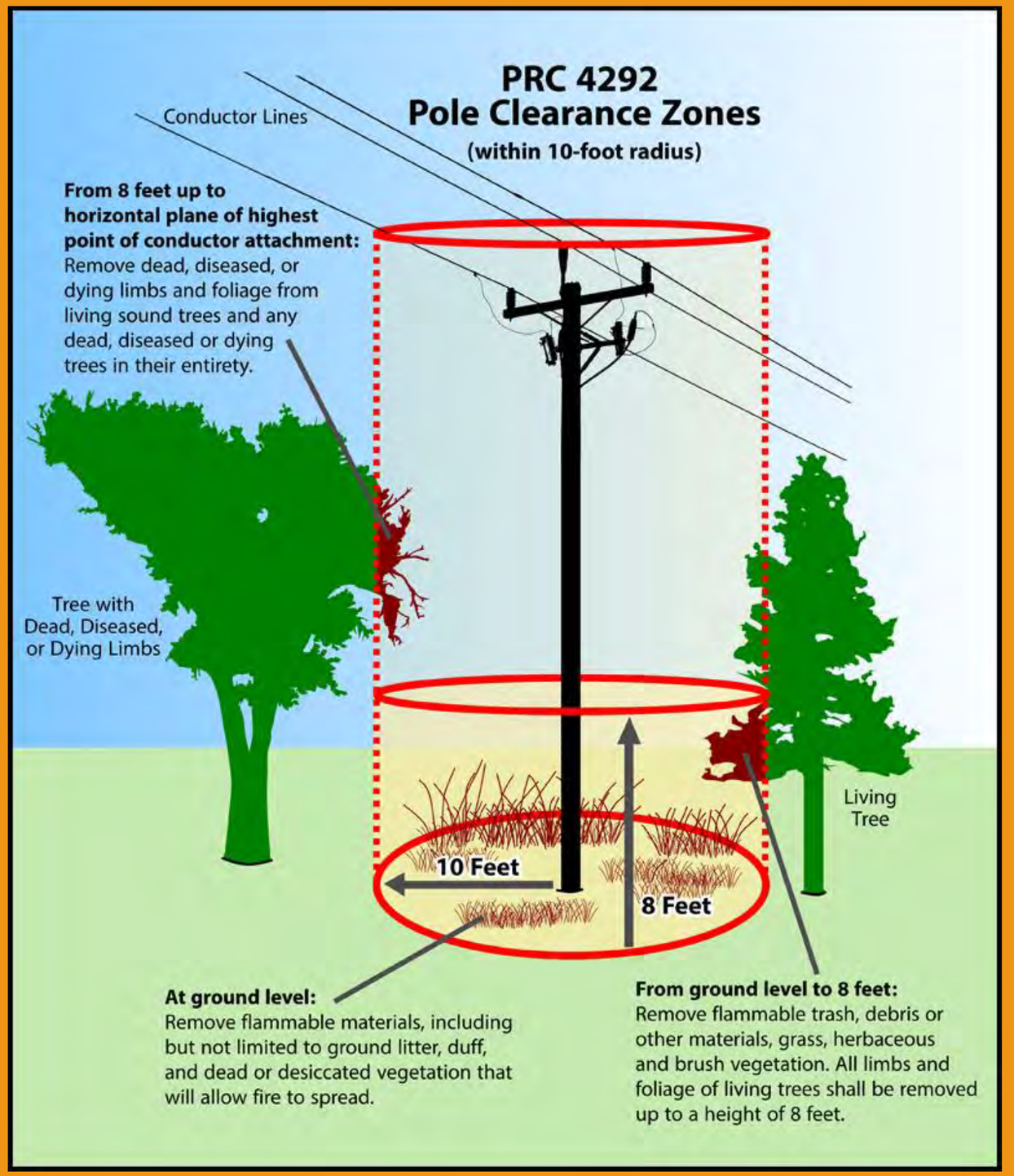
PRC 4292 Clearance

Clearance

- 10’ flammable material clearance from outer circumference of pole or tower.
- 0-8’ flammable material clearance above ground level.
- Removal of all dead, diseased, and dying limbs and foliage from height of 8’ to conductors

Flammable material includes:

- Grass, herbaceous and brush vegetation, limbs, foliage of living trees up to 8’.
- Remove flammable trash, debris, other materials.



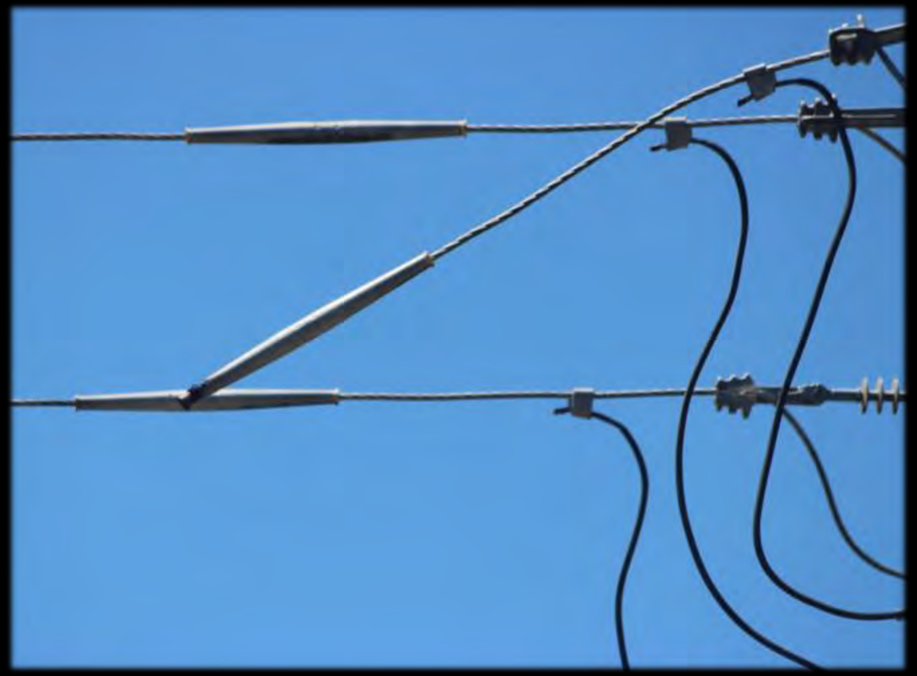
PRC 4292 – What Poles require clearance

- Power lines must have more than 750 volts otherwise considered low voltage (PRC 4296).
- Any pole or tower which supports a switch, fuse, transformer, lightning arrestors, etc. (PRC 4292).
- Any pole or tower within the (SRA) State Responsibility Area (CA Code of Regulations CCR Title 14 Section 1252).
- Applies during CAL FIRE declared Fire Season (CCR Title 14 Section 1253).
- If all the equipment being used on the pole does not create and arcs and sparks under normal operation and is Exempt Equipment (CCR Title 14 Section 1255 and Exempt hardware section of Power Line Fire Prevention Field Guide).



EQUIPMENT/FACILITY FAILURE

Root cause was failure of equipment or other infrastructure.



Automatic Splice Failure

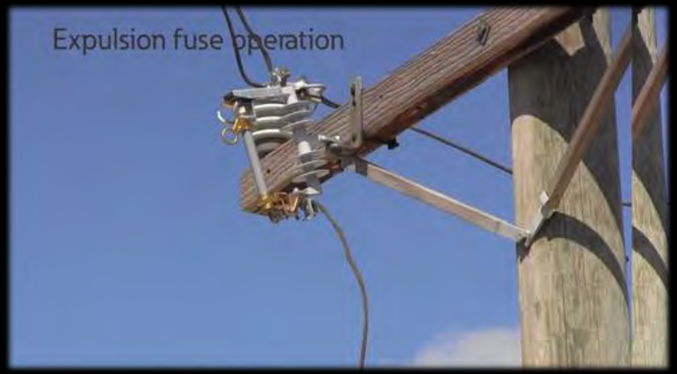


Fuse Failure

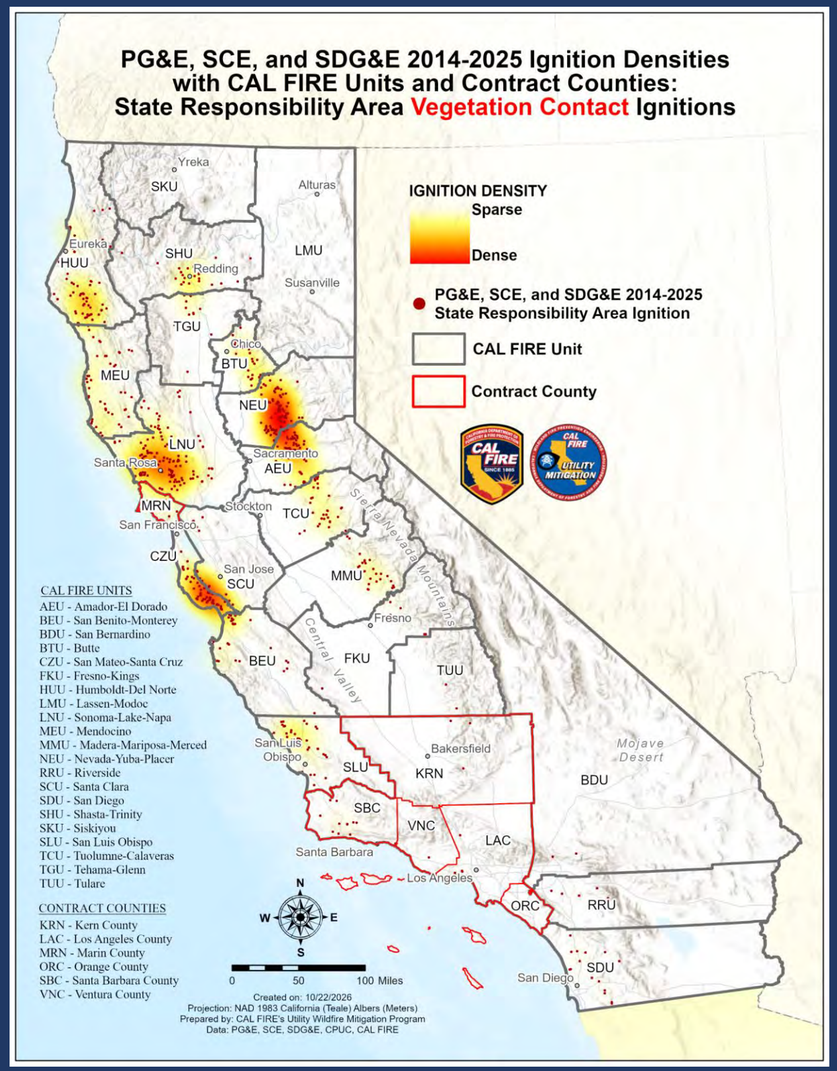




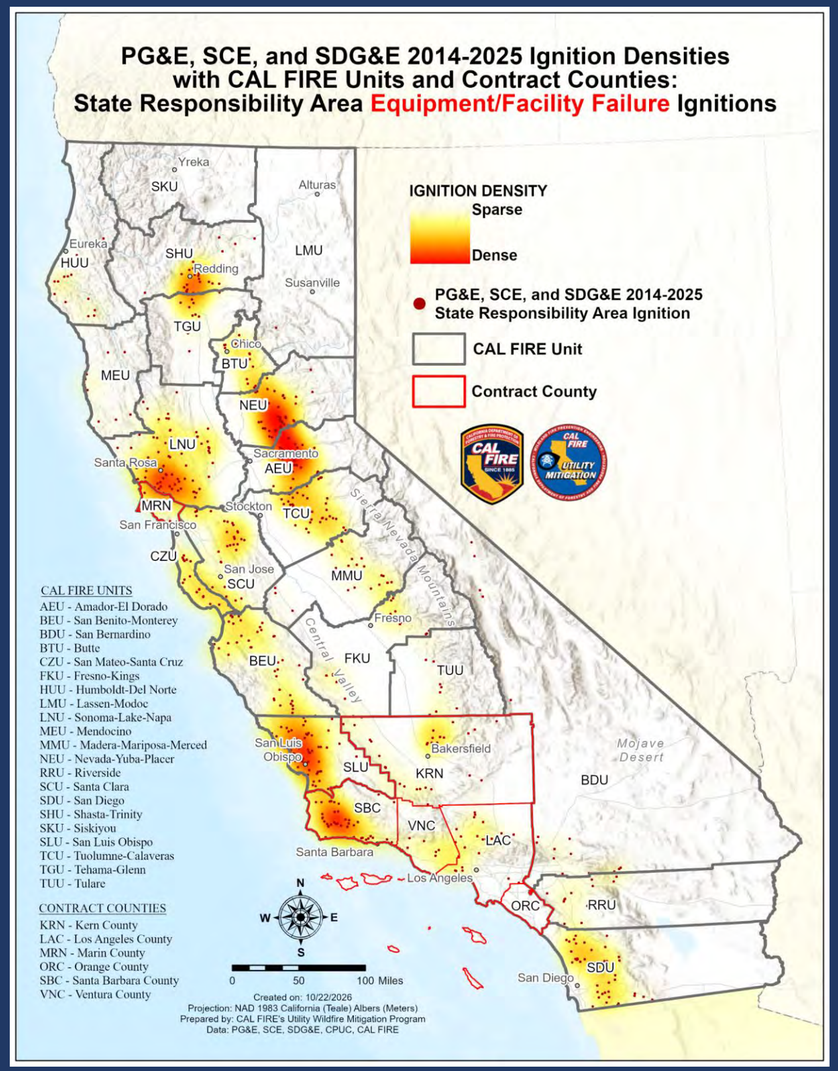
Pole Failure



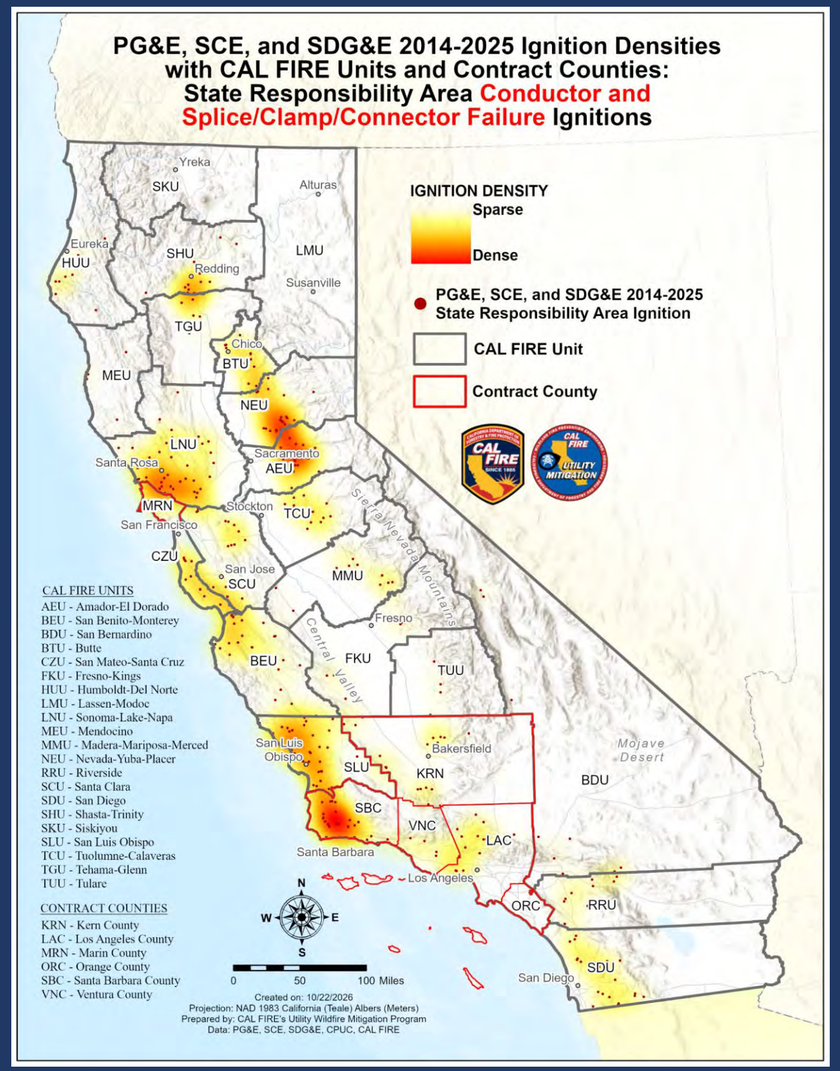
Vegetation Contact



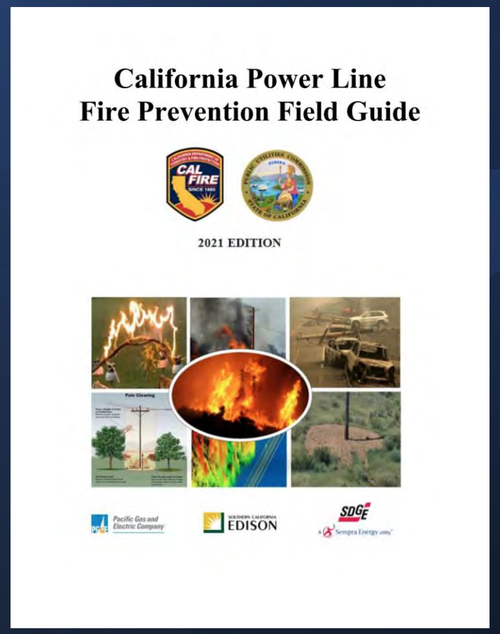
Equipment/Facility Failure

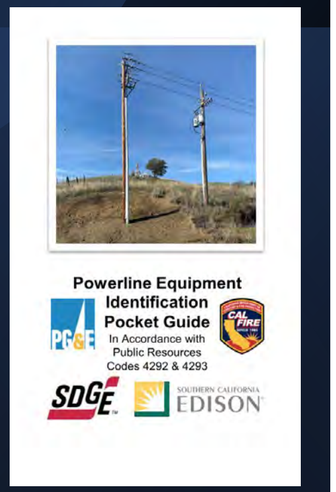


Conductor and Splice/Clamp/Connector Failure



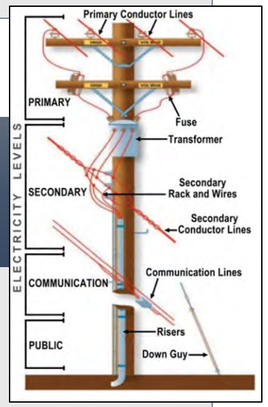
Powerline Fire Prevention Field Guide





Collaborative Document

- CAL FIRE
- USFS
- BLM
- CPUC
- Energy Safety
- Utilities



Includes:

- Basic Power Systems, Levels of Power
- Codes, Rules, Regs, PRC4292/4293
- Best practices to reduce utility-related ignitions.
- Best practices for Identifying and inspecting Hazard trees
- Powerline Equip ID (Exempt & Non-Exempt)

Joint Powerline Fire Prevention Training



- Cross-training our Defensible Space Inspectors Staff on Powerline Hazards
- Interagency Powerline Fire Prevention Training
- Joint Patrols (utility and fire agency)

CAL FIRE PSPS Notifications Process

- The California State Warning Center will issue notifications of PSPS events and updates to CAL FIRE via the Sacramento Command Center For Any:
  - Stage Changes
    1. Activating PSPS protocols/Potential to De-Energize
    2. Decision to De-Energize
    3. De-Energization Initiated
    4. Initiating Re-Energization Protocols
    5. All PSPS lines Re-Energized
  - Counties added or removed from scope

CAL FIRE Facility PSPS Dashboard

CAL FIRE PSPS Dashboard (consult map legend to determine PSPS status; click on OES PSPS Hub tab below for OES dashboard)

Filter by CAL FIRE unit.
No unit selected

Unit and facility breakdowns refresh every 15 minutes and change when applicable. Affected unit and facility breakdowns and facilities displayed on initial map may not be current.

Potentially Impacted Facilities
Click on facility to zoom to it in map.

Units with Potentially Impacted Facilities and Facility Breakdowns

- Devore FS
- **BDU** Running Springs
- **BDU** Strawberry Peak COM
- **BDU** Crestline
- **BDU** Pilot Rock Fire Center
- **BDU** Owens Valley CC
- **BDU** Bishop FS
- **BEU** Lockwood FS
- **BEU** Calandra COM/LO
- **BTU** Jarbo Gap FS
- **BTU** Stirling City FS
- **BTU** Forest Ranch FS

BDU
BEU
BTU
FKU
LAC
LNU
MMU
ORC
RRU
SBC
SCU
SHU
TGU
VNC

Fire Stations
53

Communications Sites
13

Conservation Camps or
5

Air Attack Bases
0

Helitack Bases
0

Emergency Command
1



Affected Facilities and Outage Areas | OES PSPS Hub

MAP LEGEND

Affected CAL FIRE Facilities

- Region Headquarters
- Unit/Contract County Headquarters
- State Fire Marshal Office
- Sacramento Administration
- Air Attack Base
- Helitack Base
- Emergency Command Center
- Interagency Emergency Command Center
- Equipment Facility
- Operations Center
- Training Center
- Conservation Camp
- Youth Conservation Camp
- Fire Center - CCC
- Fire Center - Firefighter Crews
- National Guard Station
- Fire Station - Schedule A
- Fire Station - Schedule B
- Fire Station - Schedule A/B
- Fire Station - Contract County (Greybook)
- Fire Station - Local
- Fire Station - Other
- Demonstration Site Area
- Nursery
- State Forest Visitor Center

State Executive Calls

CAL FIRE Attendee's

- Executive
- SAC Duty Chief
- Utility WildFire Mitigation

PSPS Briefing Interests

- Weather Summary
- Updates to period of concern
- Customer impacts
- Currently de-energized
- Weather all-clear times
- Estimated re-energizations

CAL FIRE - Utility Fire Mitigation Contacts

Questions?

For more information, contact:

- Deputy Chief Shaun Fairbanks
  - shaun.fairbanks@fire.ca.gov



A New Approach to Monitoring

Presented by:

Nikki Hill, Grow with Trees
tumbleweed@growwithtrees.com

Liberty California Vegetation Monitoring Program

A New Approach to Monitoring



NIKKI HILL

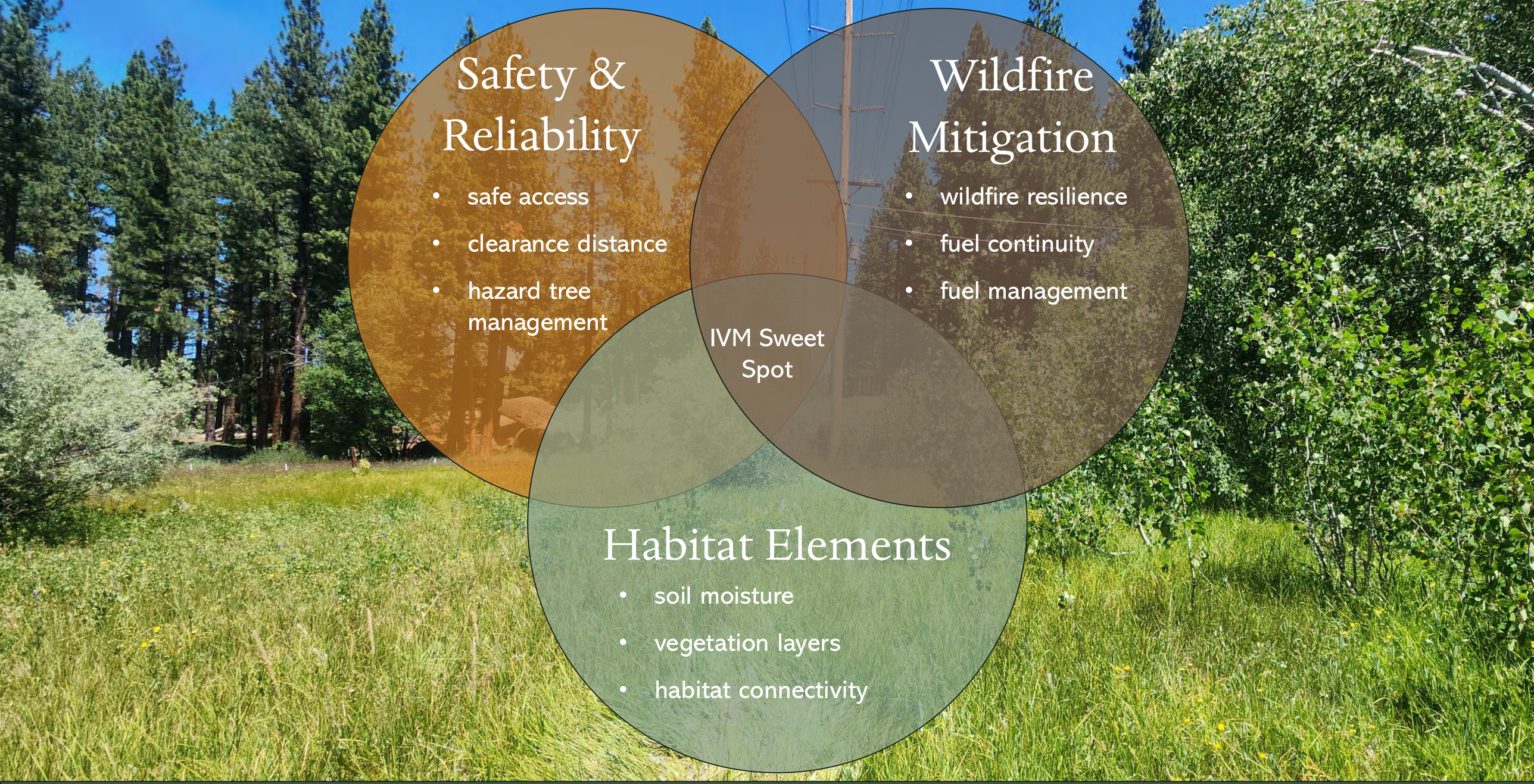
COMPATIBLE
SPECIES SPECIALIST

What does a successful ROW need to accomplish?

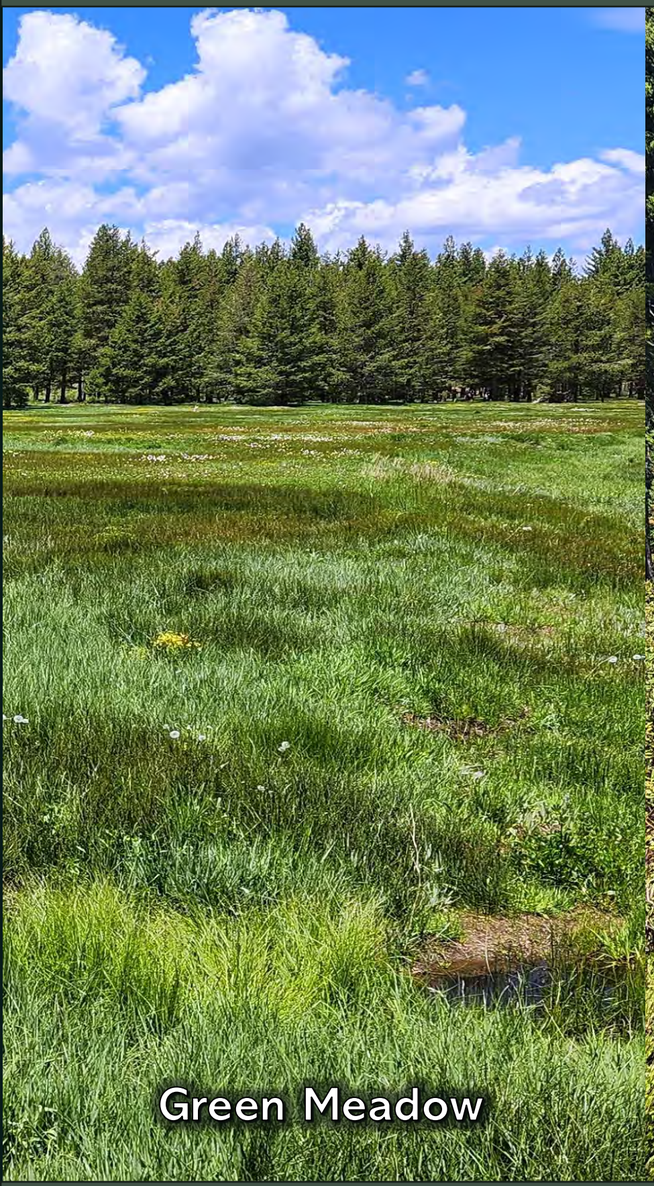


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Safety & Reliability
• safe access
• clearance distance
• hazard tree management
Wildfire Mitigation
• wildfire resilience
• fuel continuity
• fuel management
IVM Sweet Spot
Habitat Elements
• soil moisture
• vegetation layers
• habitat connectivity

What conditions are we working towards?









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Traversing the Landscape Mosaic

- Identify potentially compatible communities: meadows/prairie, shrub/scrub, and wetland.
- Work with site conditions and vegetation responses to treatment.
- Connect ROW management to landscape continuity and resilience.



Wetland Communities

Meadow/Prairie Communities

Shrub/Scrub Communities

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Disturbance Regeneration Pathways

Disturbance starts a new regeneration pathway



Work with natural regeneration



Intervene before incompatible conditions establish



Manage toward stable, compatible, lower-maintenance vegetation



When and how should we intervene so the site remains operationally compatible while developing toward a stable, lower-maintenance condition?



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3 Lake Tahoe Area Cover Types

Meadow/Prairie Communities

Shrub/Scrub Communities

Wetland Communities



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Functional Subcategories: 8 Habitat Types

Meadow/Prairie Communities

Dry Meadow



Wet Meadow



Shrub/Scrub Communities

Montane Chaparral



Mountain Sagebrush



Shrub Thicket



Wetland Communities

Riparian



Fresh Emergent



Spring/Seep



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8 Habitat Types: A Shared Field Language

Recognizing site conditions, regeneration trajectories and management opportunities





4.2 BMP Considerations for Meadow/Prairie Habitat

During the summer months, mountain meadows are considered the most important habitat for birds. It has been estimated that over 50% of wet and dry meadows in the Lake Tahoe Basin have been lost. In the Sierra Nevadas, 37 species of birds are either critically dependent or strongly associated with montane meadows. Meadow habitats further serve to recycle nutrients, purify water, attenuate floods, recharge groundwater, and contribute to habitat heterogeneity within forested ecoregions that benefit a variety of wildlife.

Conifer encroachment into meadows can be induced by natural processes, climate cycles, and alteration to underlying hydrology. Meadows are typically more diverse in the Sierra Nevadas than in adjacent forests and therefore replacement of meadow vegetation by conifer forest can reduce local and landscape biodiversity.

Succession of dry meadow to coniferous forest is frequent at montane and subalpine elevations. At lower elevations, succession to broad-leaved trees or shrubs, particularly sagebrush, may occur.

The most important factors in creating and maintaining wet meadows are natural water level fluctuations and recurring fire.

❖ Assessment

- Identify what type of meadow is present using indicator species.
- Assess herbaceous cover, differentiating between graminoids and forbs.
- Assess shrub cover along riparian areas and throughout meadow area.
- Persistent standing water and dense riparian shrub cover are two characteristics that are often lost when meadow sites are degraded. Assess density of shrubs near stream channels, seasonal flooding spread, and persistence of standing water.
- Vegetation vitality throughout the dry summer season indicates soil moisture retention.
- Downcutting of a stream channel can alter meadow hydrology and plant community by disconnecting the floodplain. Assess channel incision.

- Assess conifer encroachment stage and intensity at a site:
  - **Inactive encroachment:** Only older trees with no seedlings or saplings.
  - **Active encroachment:** Spatial stratification of tree ages, with younger trees along the inner extents of conifer encroachment.
  - **Intensifying in place:** Mix of tree ages within the encroached area that does not extend further into meadow. Indicates upland zones or other barriers to further encroachment (such as a wet soil moisture edge).
- Assess whether woody encroachment is occurring on upland soil patches (raised dry areas) or in low moist zones.
- Use habitat requirement checklists for key meadow species to assess site conditions and make recommendations. Wet meadow key bird species of the Sierra Nevadas include sandhill crane, willow flycatcher, yellow warbler, and calliope hummingbird.
- Consider using birds as indicators of meadow health and available habitat because they respond quickly to changes in structure and composition. This can be assessed by identifying the abundance of various species or by selecting focal species of the Sierra Nevada region:
  - **Common meadow-associated focal species:** Yellow warbler, Lincoln's sparrow, song sparrow, and white-crowned sparrow.
  - **Rare meadow-associated focal species:** Willow flycatcher, sandhill crane, common yellowthroat, Virginia rail, and Wilson's phalarope.

❖ Protection

- Use existing roads to access meadows.
- Refrain from ground-disturbing activities during wet meadow conditions, which can damage bulbs and other reproductive storage structures of perennial forbs.
- Time mowing or any ground-disturbing activities to occur after seed set of herbaceous flowering plants.
- Avoid management activities during bird breeding and nesting season (May through July in the Sierra Nevadas).

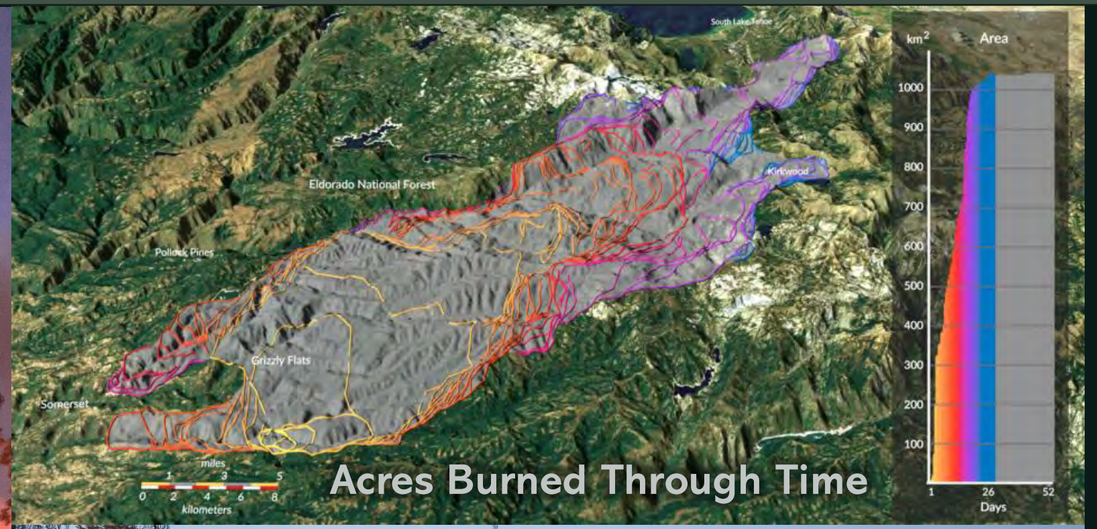
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What will grow back here, and how can we guide that growth toward vegetation that meets our management goals?



Caldor Fire



Acres Burned Through Time



Post-Disturbance Landscape

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Program Origin: Learning From Recovery

Three real-world disturbance pathways created an opportunity to track vegetation recovery over time.



Caldor: Section T640
Disturbance Pathway:
Mechanical (Bulldozed)



Tamarak: Section MULLER1296
Disturbance Pathway:
Fire (Burned)



Section HOB7700
Disturbance Pathway:
Reclamation (Masticated)

Two Complementary Views of Vegetation Recovery

Long-Term: 3 sections, 11 spans per section



Follow known disturbances and recovery through time.

Fixed Plot: 20% of Sub Transmission Lines

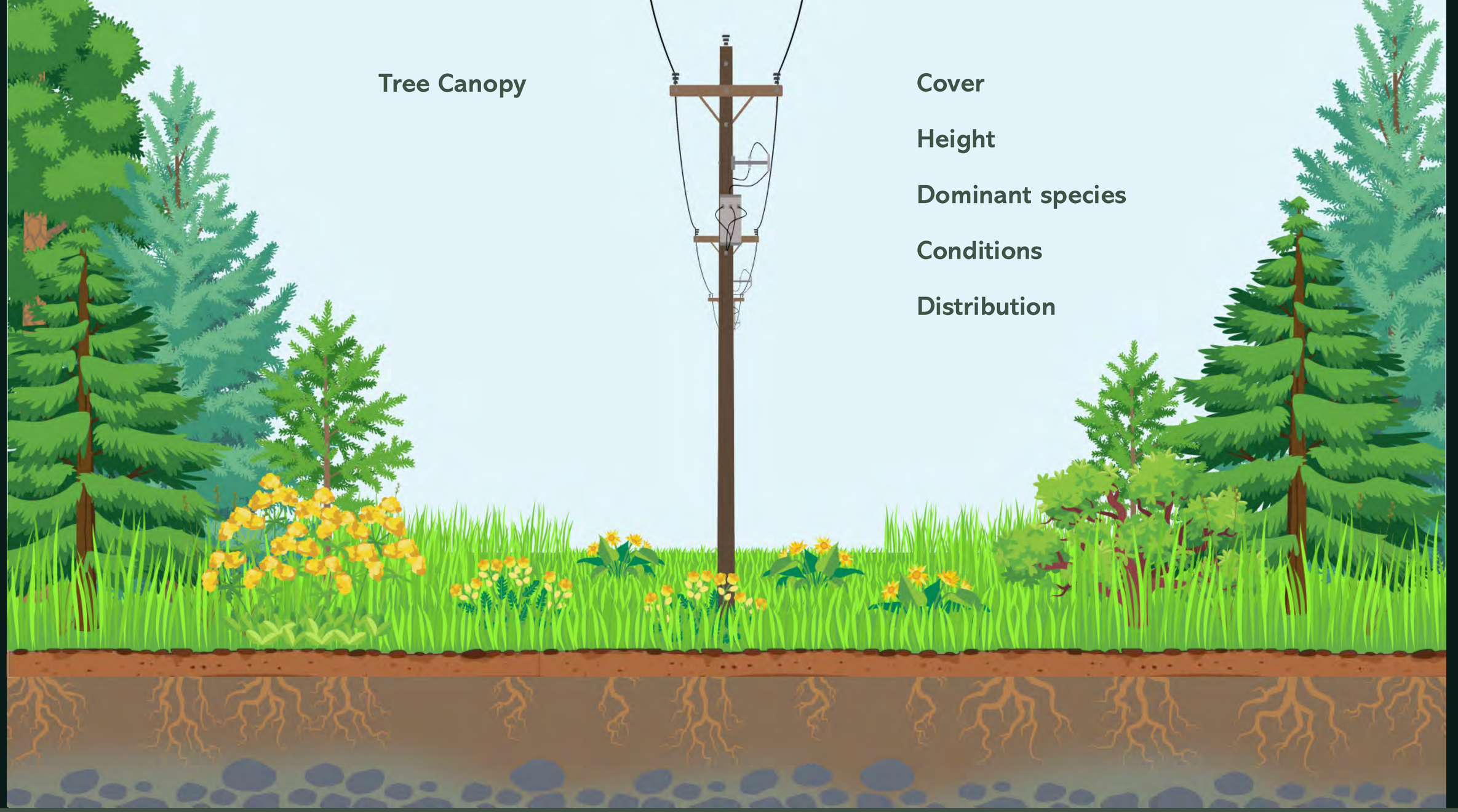


Capture a representative range of vegetation conditions across the system.

Understanding both local recovery and system-wide conditions supports more informed vegetation management.

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Field Note Nested Data Collection



Plot Polygon (Field Note)

all records spatially linked to the same monitoring plot

Habitat Form

(Primary Record/Parent Form)

circuit, ecoregion, connecting landscape

6 Photo Points

document conditions and track changes

Cover Form

percent cover and qualitative data layers

Surface Layer

water, duff, wood chips, rocks, soil, pavement

Vegetation Layer

graminoids, forbs, subshrubs, shrubs, saplings, canopy

Species Inventory

individual form for each species encountered

- Plant Type Category Form
- Abundance Class
- Phenology

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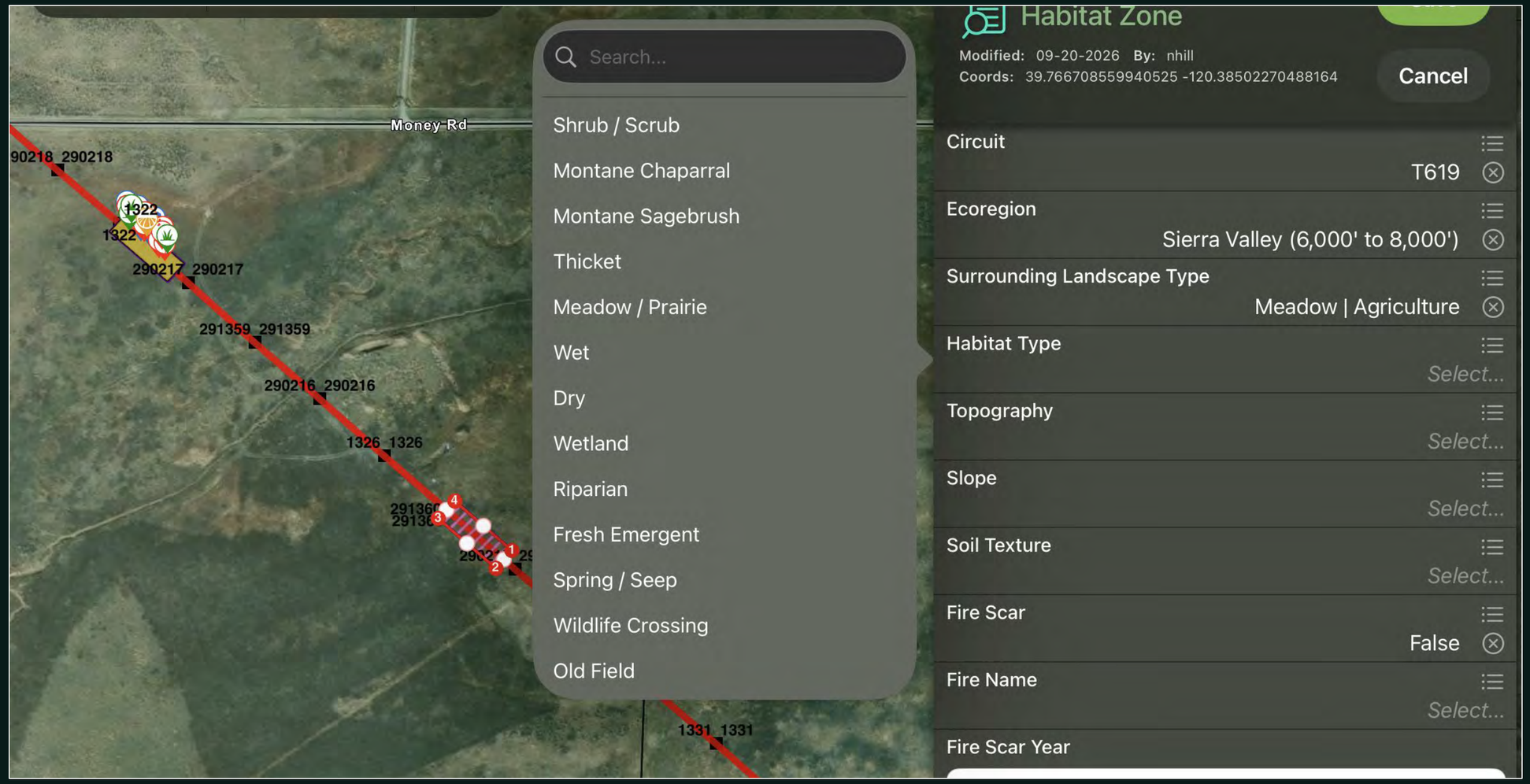
GROW WITH TREES

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GROW WITH TREES

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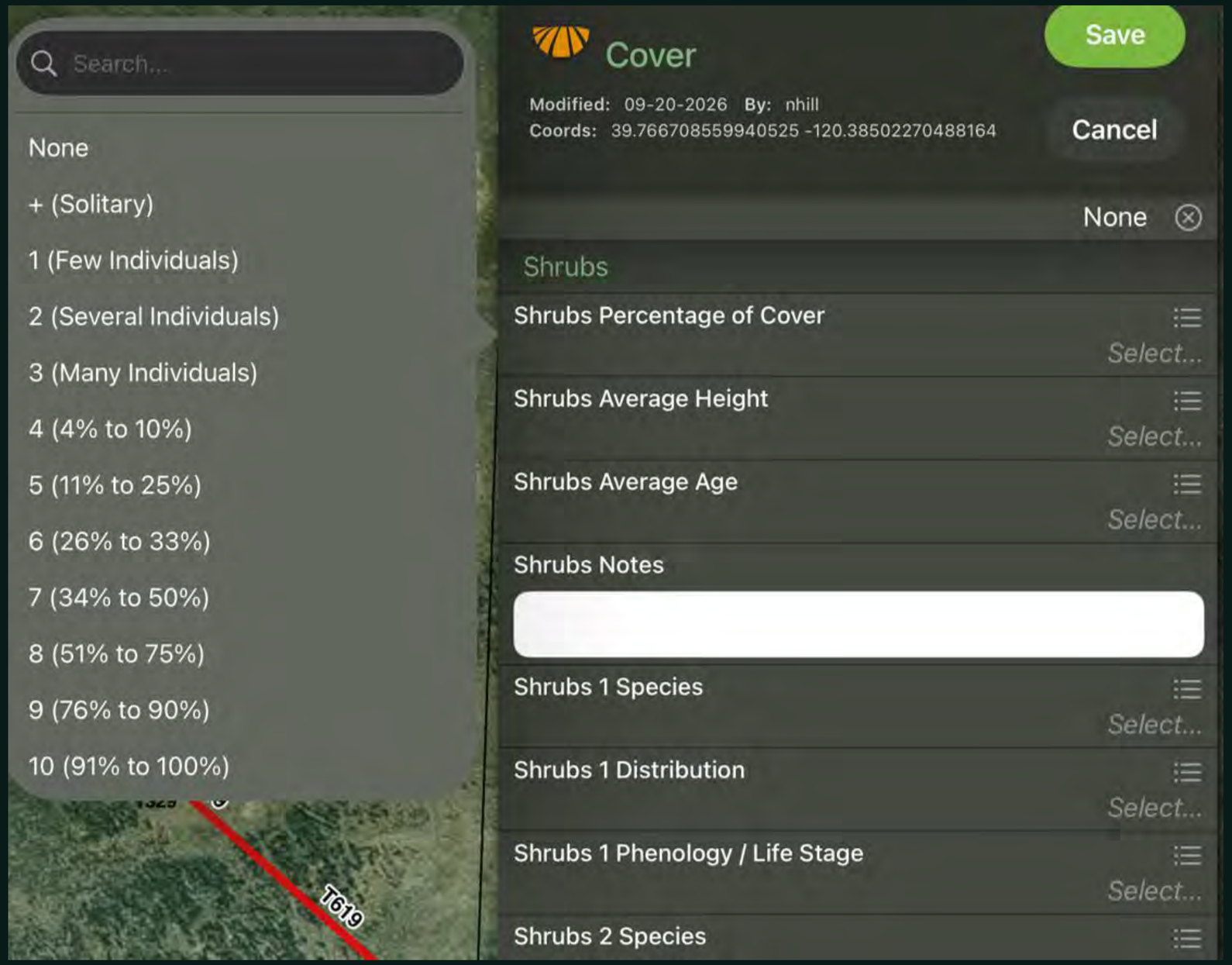
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GROW WITH TREES

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- Abundance Class
- Phenology

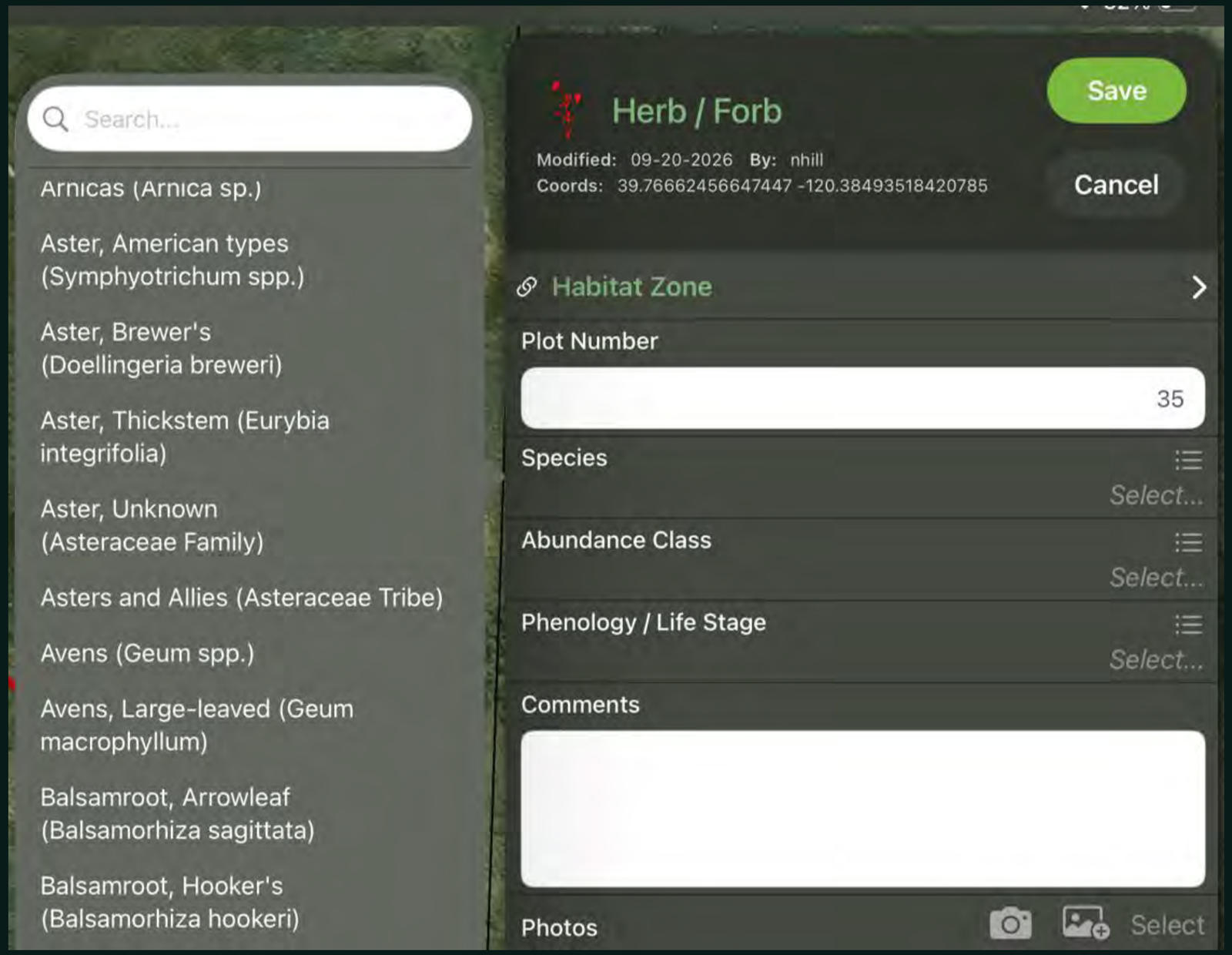
Liberty™

GROW WITH TREES

Species Inventory

individual form for each species encountered

- Plant Type Category Form
- Abundance Class
- Phenology



Liberty™

GROW WITH TREES

Field Note Nested Data Collection



Plot Polygon (Field Note)

all records spatially linked to the same monitoring plot

Habitat Form

(Primary Record/Parent Form)

circuit, ecoregion, connecting landscape

6 Photo Points

document conditions and track changes

Cover Form

percent cover and qualitative data layers

Surface Layer

water, duff, wood chips, rocks, soil, pavement

Vegetation Layer

graminoids, forbs, subshrubs, shrubs, saplings, canopy

Species Inventory

individual form for each species encountered

- Plant Type Category Form
- Abundance Class
- Phenology

Liberty™

GROW WITH TREES

Three Sites, Different Starting Points

	Caldor: Section T640	Tamarak: Section MULLER1296	Section HOB7700
Disturbance Pathway	Mechanical (Bulldozed)	Fire (Burned)	Reclamation (Masticated)
Habitat Type	Lake-level montane chaparral / stream crossings	Lower-elevation high-desert sagebrush / pine	Higher-elevation montane chaparral
Monitoring Question	“Does shrub recovery remain compatible?”	“What perennial community develops?”	“What does recovery tell us about re-entry?”

Caldor: Section T640 Mechanical Disturbance & Recovery

2022

Bare soil along bulldozed WUI corridor. Plot 96% bare ground.



2023

Seep zone recovery, bare soil declines to 63% with annual forb "mats" and initial litter accumulation.



2024

Shrub seedlings and stump regeneration begin; 16 species documented. Graminoid cover growing to 18%.



2025

Shrub & subshrub cover establish as visible cover, 41 species documented. Bare soil declines to 30%. Perennial forbs and grasses expand.



2026

Shrub cover persist while saplings cover more apparent in 63% litter ground. 48 species documented.



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GROW WITH TREES

Tamarak: Section MULLER1296 Post-Fire Succession & Recovery

2022

Wood chips 63% & bare soil from Tamarack fire clean up. Sparse vegetation presence.



2023

Early herbaceous response. Rhizome type grasses reestablish and annual forbs peak at 30% cover.



2024

Perennial forbs and subshrubs regenerate with annual grass proliferation. 7 species recorded, Peak graminoid cover 63%.



2025

Perennial bunchgrasses take hold, annual grasses persist. 10 species recorded.



2026

Perennial grasses persist while forb richness declined. Modest woody recovery with increased shrub height . 7 species recorded.



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GROW WITH TREES

Section HOB7700 Reclamation & Recovery

2022

Pre-mastication baseline: Closed shrub canopy recorded before later-2022 mastication.

(No Photo)

2023

Early post-treatment condition: Post mastication debris cover with early regenerating shrub layer. 2 shrub species recorded.



2024

Regenerating woody cover: Shrubs 42% & subshrubs 8%. 5 woody species recorded.



2025

Developing post-treatment structure: 9 species recorded with forbs appearing. Stable woody cover.



2026

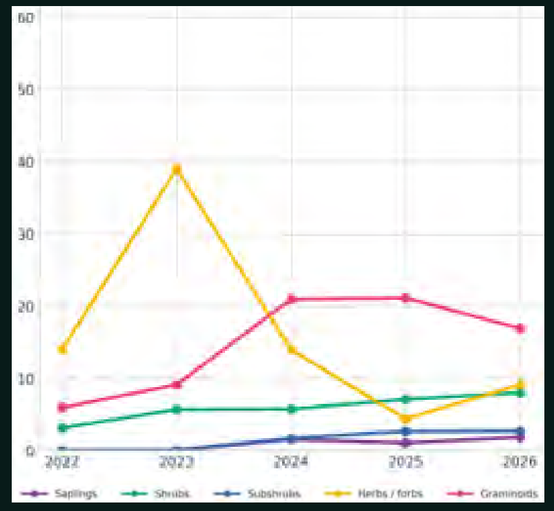
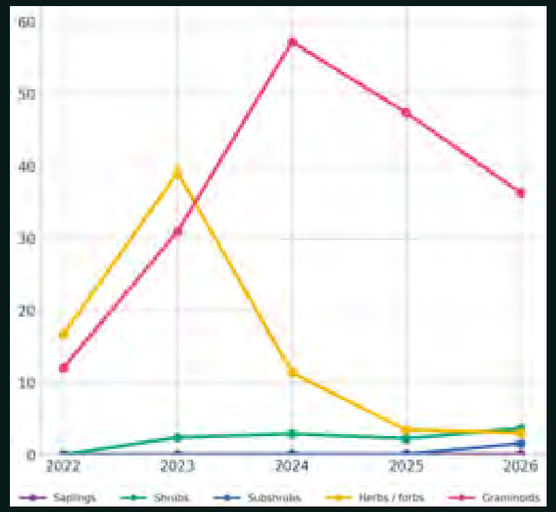
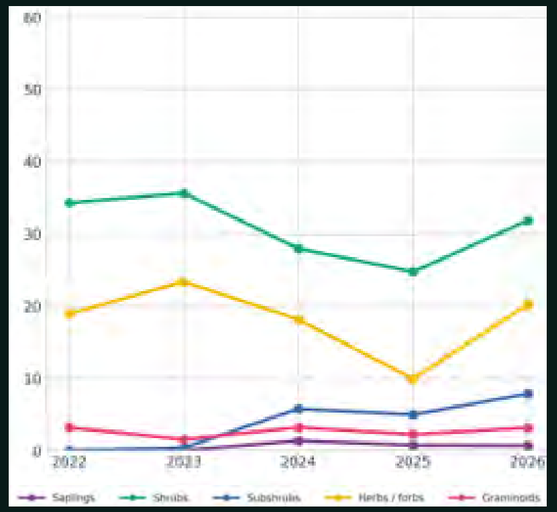
Layered woody condition: Shrub & subshrub cover stable, woody debris increases to 18%. 12 species recorded, graminoids appear.



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GROW WITH TREES

Three Sites, Different Recovery Paths

	Caldor: Section T640	Tamarak: Section MULLER1296	Section HOB 7700
Disturbance Pathway	Mechanical (Bulldozed)	Fire (Burned)	Reclamation (Masticated)
Current Vegetation	Retains relatively high graminoid and sedge cover while shrubs regenerate within the disturbed corridor.	Developing a graminoid-dominated post-fire community, with perennial grasses persisting alongside cheatgrass and early re-establishment of sagebrush, bitterbrush, and Ceanothus.	Remains more shrub-influenced following planned reclamation, with vegetation recovery occurring within a different structural and compositional setting.
2022-2026 Long-Term Vegetation Monitoring Trends			

Saplings Shrubs Subshrubs Herbs/Forbs Graminoids

Interpreting Recovery

Species Inventory

365 species recorded across the long-term monitoring plots.

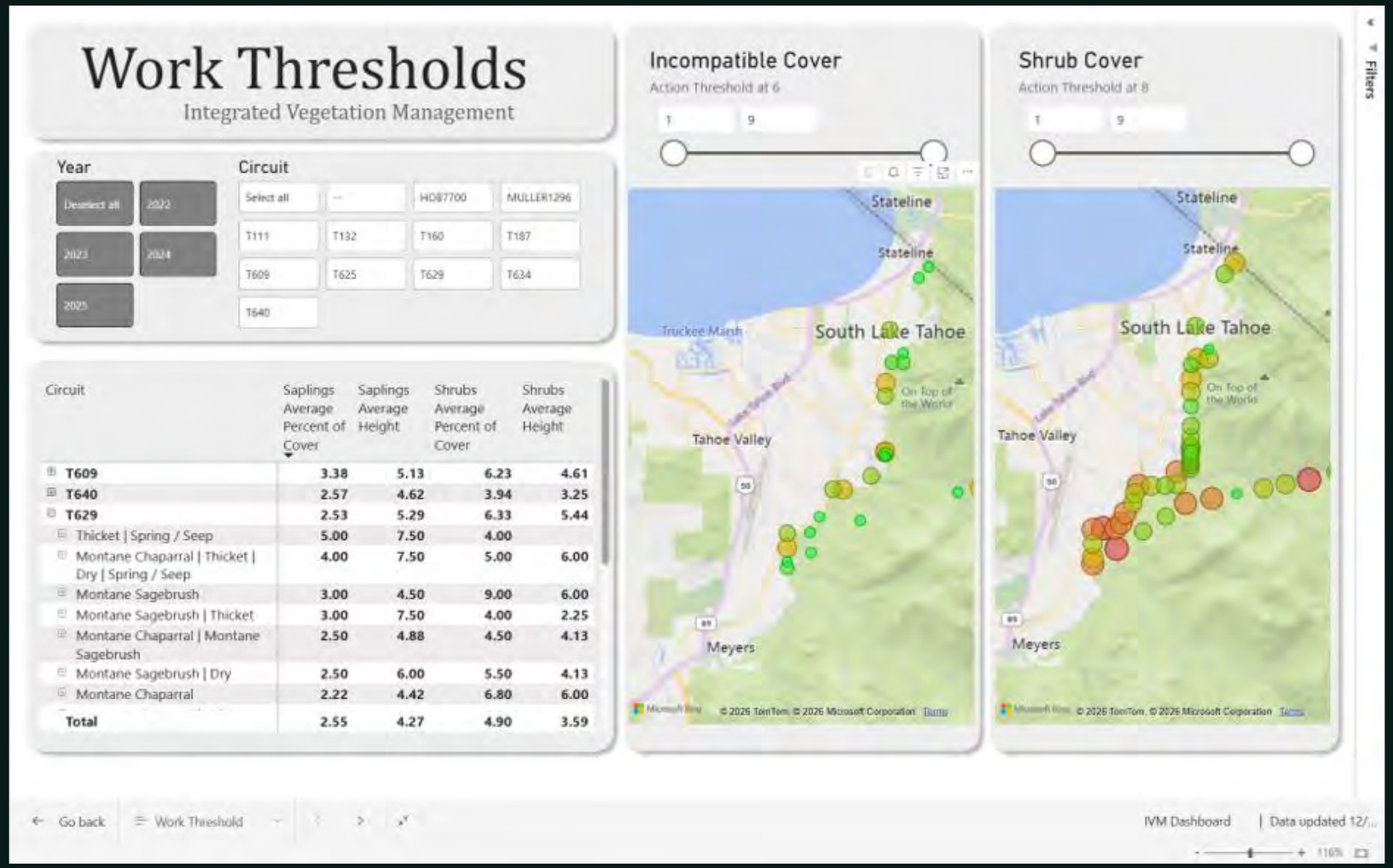
Different Conditions, Different Implications

Shrub increase, graminoid increase, or forb decline are not automatically positive or negative. Their meaning depends on the species present, cover, height, continuity, spatial pattern, site setting, and operational objectives.

Still to Learn

Is recovery moving toward a stable, compatible condition—or toward a condition that will require earlier or more intensive management re-entry?

Using the Data for Utility Decisions



Liberty™

GROW WITH TREES

Key Takeaways

Disturbance events and routine maintenance both initiate regeneration; monitoring reveals whether that regeneration is moving toward compatible or incompatible conditions.

A field-observable, adaptable framework, grounded in 8 common LTB habitat types, gives crews and managers a shared way to read vegetation conditions and recognize developing trajectories.

Continued crew field trainings on plant ID and cover type recognition make desired site conditions monitoring relatable to field crew decisions during treatments.

The goal is not a uniform ROW—it is a stable, compatible, lower-maintenance vegetation condition that supports reliability, wildfire resilience, habitat value and species diversity within the greater landscape mosaic.

A Moment to Reflect

Thank you!

If you have additional thoughts or questions, you can reach me at:

tumbleweed@growwithtrees.com









Utility Safety Outreach to Non-Utility Arborists

Presented by:

Julius Uehlein, PG&E, jmu2@pge.com

Ryan Wake, PG&E, RCWv@pge.com

and Christian Yungert, PG&E, Christian.yungert@pge.com

From Ground Patrols to Geospatial Intelligence: Reinventing Distribution Vegetation Management





Presented by:

Jennifer Whitacre, NV5

Jennifer.Whitacre@nv5.com

& Peter Stoltman, Liberty Utilities,

Peter.Stoltman@libertyutilities.com



From Ground Patrols to Geospatial Intelligence: Reinventing Distribution Vegetation Management

Peter Stoltman, Director Liberty

Jennifer Whitacre, GISP, Sr Director Strategic Accounts NV5 Geospatial

Agenda

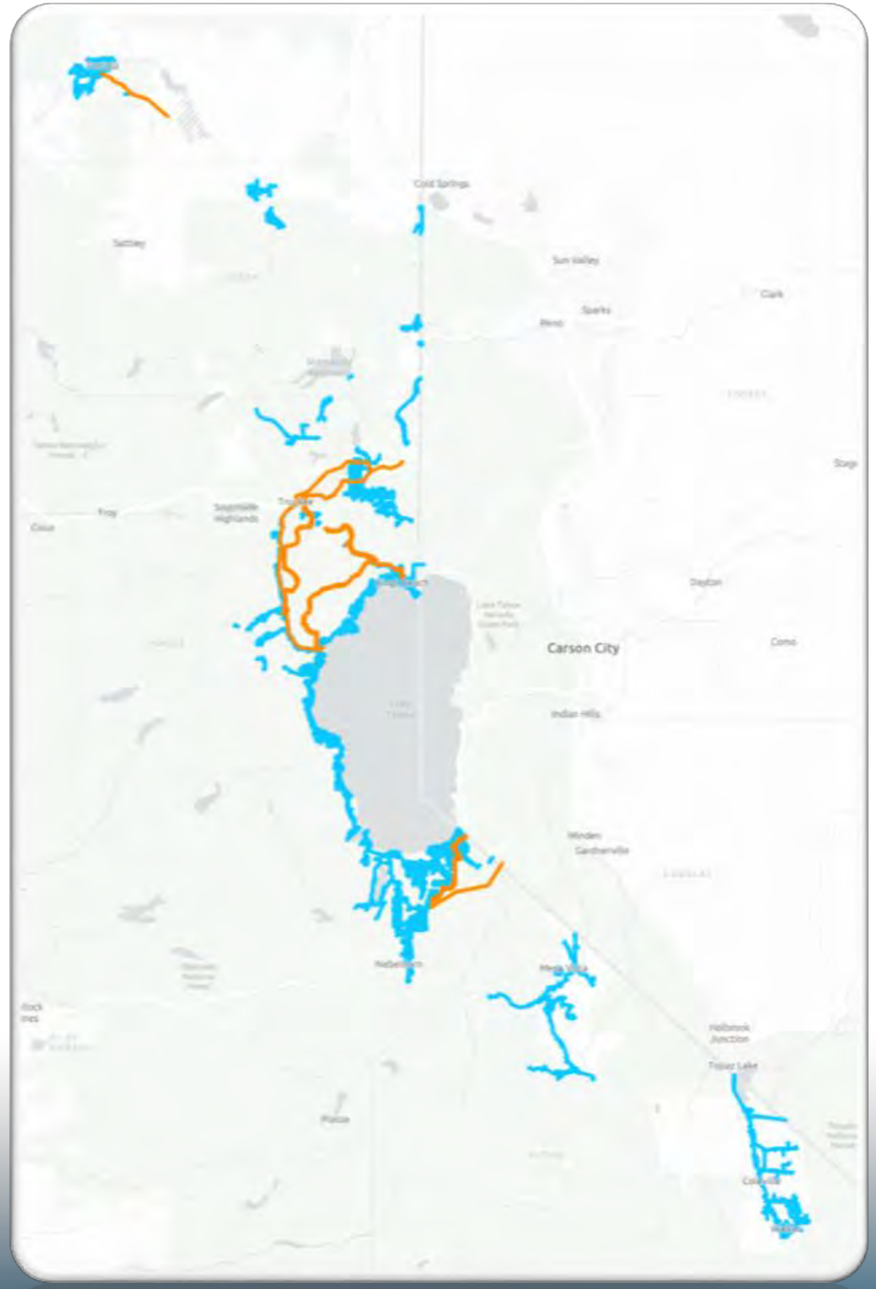
- Introduction
- The Challenge
- Geospatial Transformation
- Program History
- Technology stack
- Building the Program
- Operational Improvements
- Clearance Results
- Lessons Learned
- Replicating Success



LIBERTY OVERVIEW

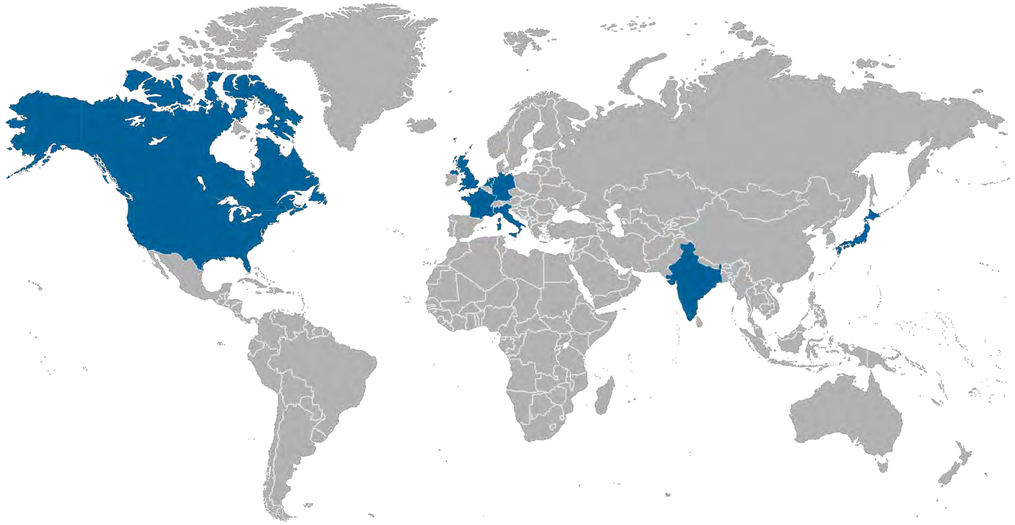
System Information

- North and South
- High Fire Threat Area
- ~50,000 Customers
- ~700 miles of Overhead Lines
  605 Distribution
  95 Transmission
- 24,000 Utility Poles
- 12 Substations
- 125 Employees



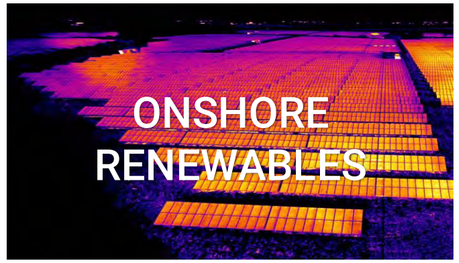
NV5 Geospatial

Providing insights to government and corporate organizations that need geospatial intelligence to mitigate risk, plan for growth, better manage resources, and advance scientific understanding.







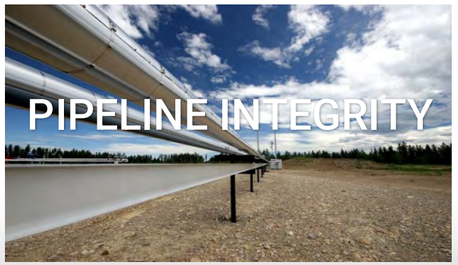


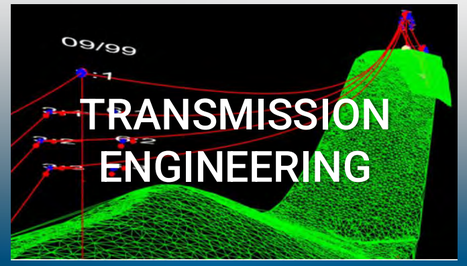


















The Challenge – Vegetation Management in High Fire Threat Districts

System Challenges

- 700+ miles of overhead lines
- Sierra Nevada terrain (Steep, Vegetated)
  - Elevations from 5,000 ft to 9,050 ft
  - 80% customers above 6,000 ft
- High wildfire risk
- High labor costs
- Traditional ground inspections:
  - Time consuming
  - Labor intensive
  - Expensive
  - Difficult to complete within target cycles



Why Change? – Limitations of Traditional Ground Based Inspections



- Remote terrain limited visibility
- Long inspection cycles
- Inconsistent data
- High operational costs
- Increased pressure to demonstrate wildfire mitigation efforts

Traditional methods were no longer scalable for modern wildfire risk management

Geospatial Transformation– Shifting from Ground Patrols to Annual Lidar Surveys

Partnership Liberty & NV5 Geospatial

Shifting from patrols:

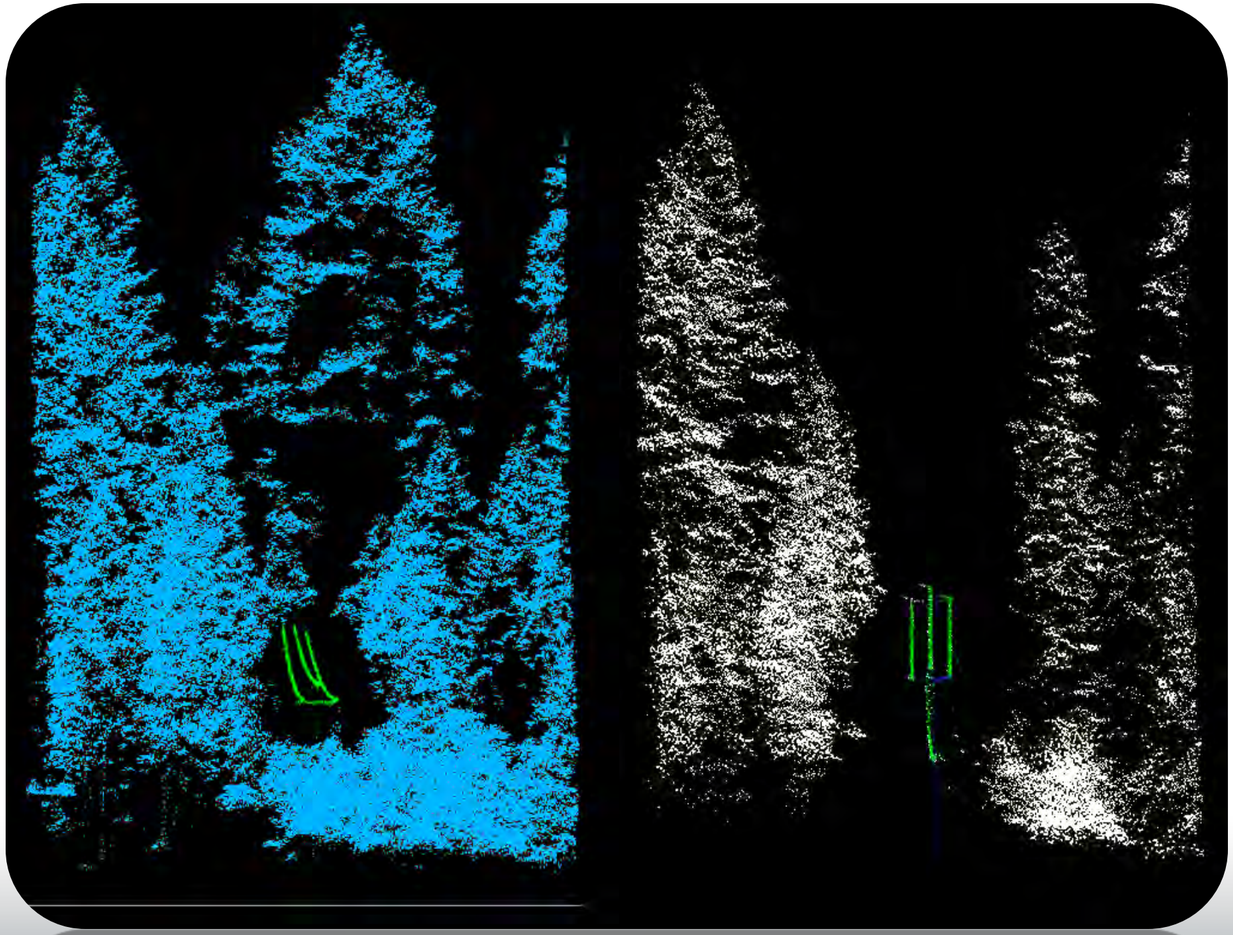
- Redirecting focus of arborists
- Providing additional tools to support

Implementation of:

- Annual aerial Lidar and other remote sensing data collections
- Geospatial analytics
- Pilot projects to explore risk identification

Outcome:

- Utility wide visibility
- Consistent annual assessments
- Data driven vegetation management



Building the Program – Program History

2020

300 miles

Rapid Reporting
Tower/Span/Conductor
Classified Lidar
Orthoimagery

Grow-In Detections
Overhang Detections

2021

700 miles

Rapid Reporting
Tower/Span/Conductor
Classified Lidar
Orthoimagery

Grow-In Detections
Overhang Detections

+ Fall-in Detections
+ Tree Health Analysis
+ Vegetation Inventory

2022

700 miles

Rapid Reporting
Tower/Span/Conductor
Classified Lidar
Orthoimagery

Grow-In Detections
Overhang Detections

Fall-in Detections
Tree Health Analysis
Vegetation Inventory

+ Tree Risk Scores

2023

700 miles

Rapid Reporting
Tower/Span/Conductor
Classified Lidar
Orthoimagery

Grow-In Detections
Overhang Detections

Fall-in Detections
Tree Health Analysis
Vegetation Inventory

Tree Risk Scores

+ Tree Lean

2024

700 miles Primary
785 miles Secondary

Rapid Reporting
Tower/Span/Conductor
Classified Lidar
Satellite

Grow-In Detections
Overhang Detections

Fall-in Detections
Tree Health Monitoring
Vegetation Inventory

+Tree Health Monitoring
+Secondary lines
& Tree Attachments

+ Satellite TH

2025

700 miles

Rapid Reporting
Tower/Span/Conductor
Classified Lidar
Satellite

Grow-In Detections
Overhang Detections

Fall-in Detections
Tree Health Monitoring
Vegetation Inventory
Updating Secondary in
.gdb

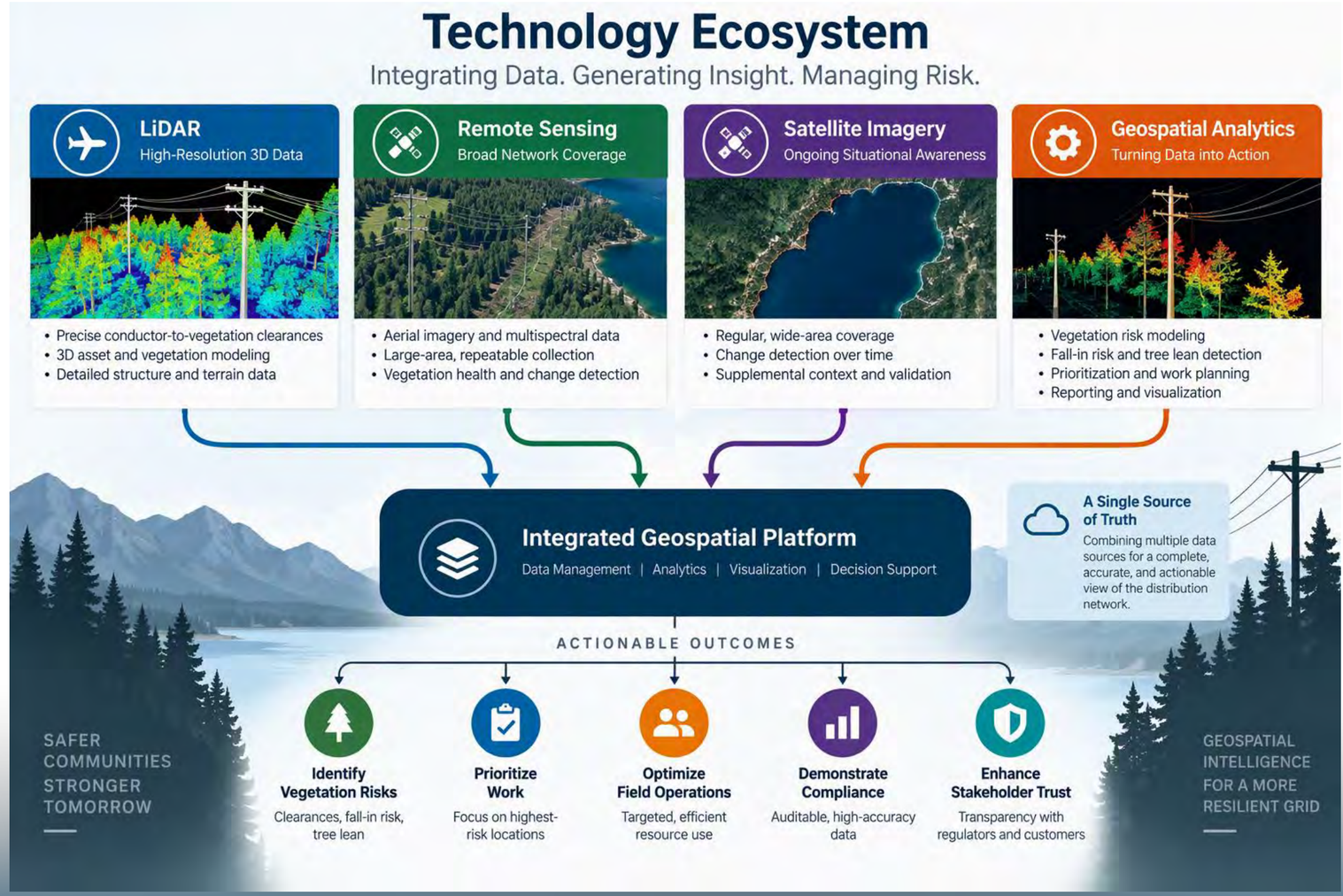
Liberty Technology Stack – Building a Modern Vegetation Management Program

Aerial Lidar
- 6 years system capture
- Precise conductor to vegetation clearances
- 3D asset and vegetation modeling

Multispectral Imagery
- 4 years full system capture
- Visualization
- Health assessments

Satellite Imagery
- 2 years full system capture
- Visualization
- Monitoring

Ground Survey
- 6 years system capture
- Data validation



Building the Program– Data Specifications and Accuracies

Lidar:

- > 35 ppsm with focus on wire capture
- 300 ft acquisition ROW
- Vertical Accuracy <10 cm RMSEz
- Relative Accuracy 6 cm

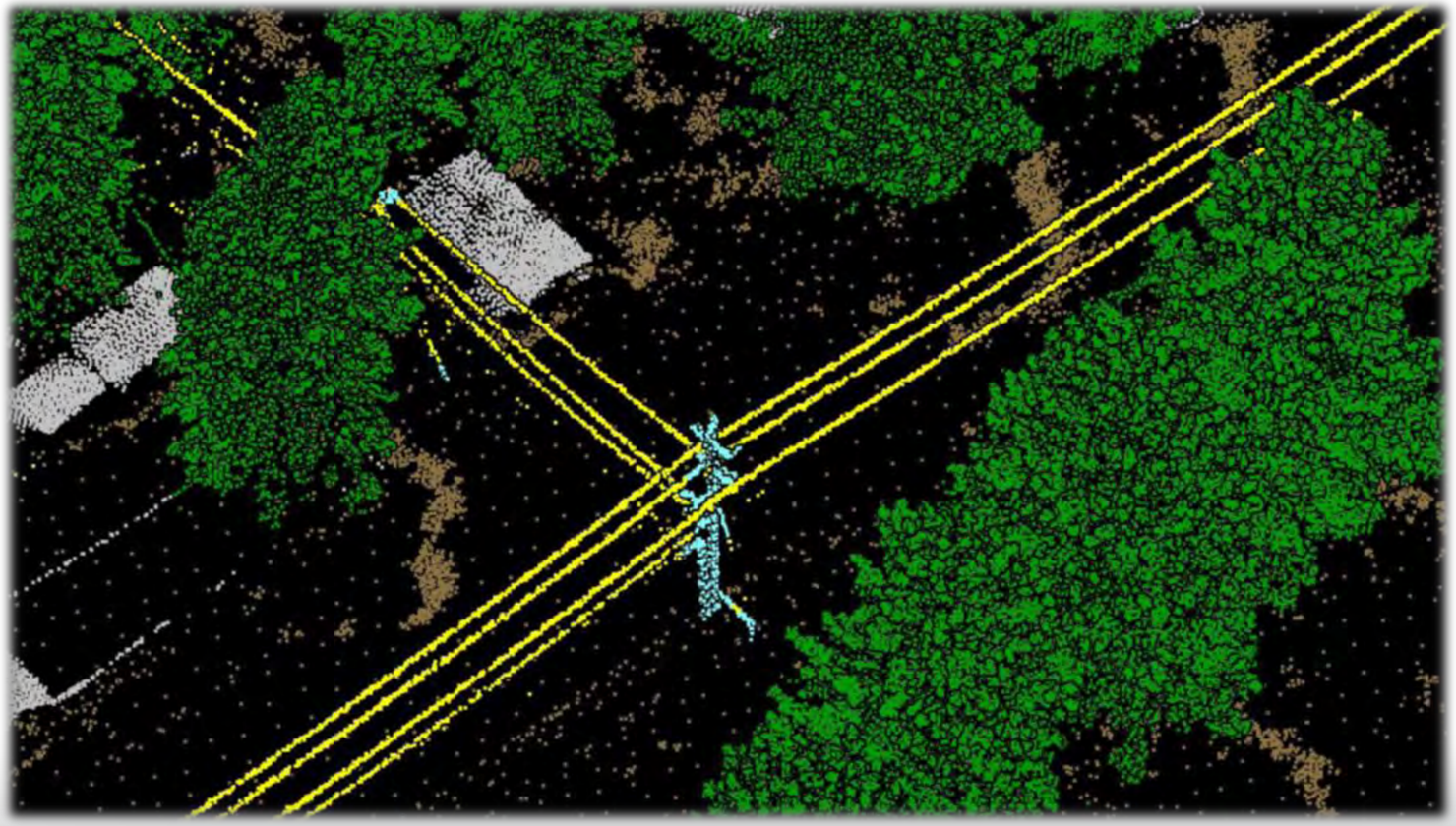
Ground Survey: 1.5 cm

Multispectral Imagery:

- 3-inch resolution
- 9-inch accuracy (3 pixels)

Satellite Imagery:

- 3.5 m with full image every 10 days
- 10.5 m RMSEr (3 pixels)



Building the Program – Clearance Analysis

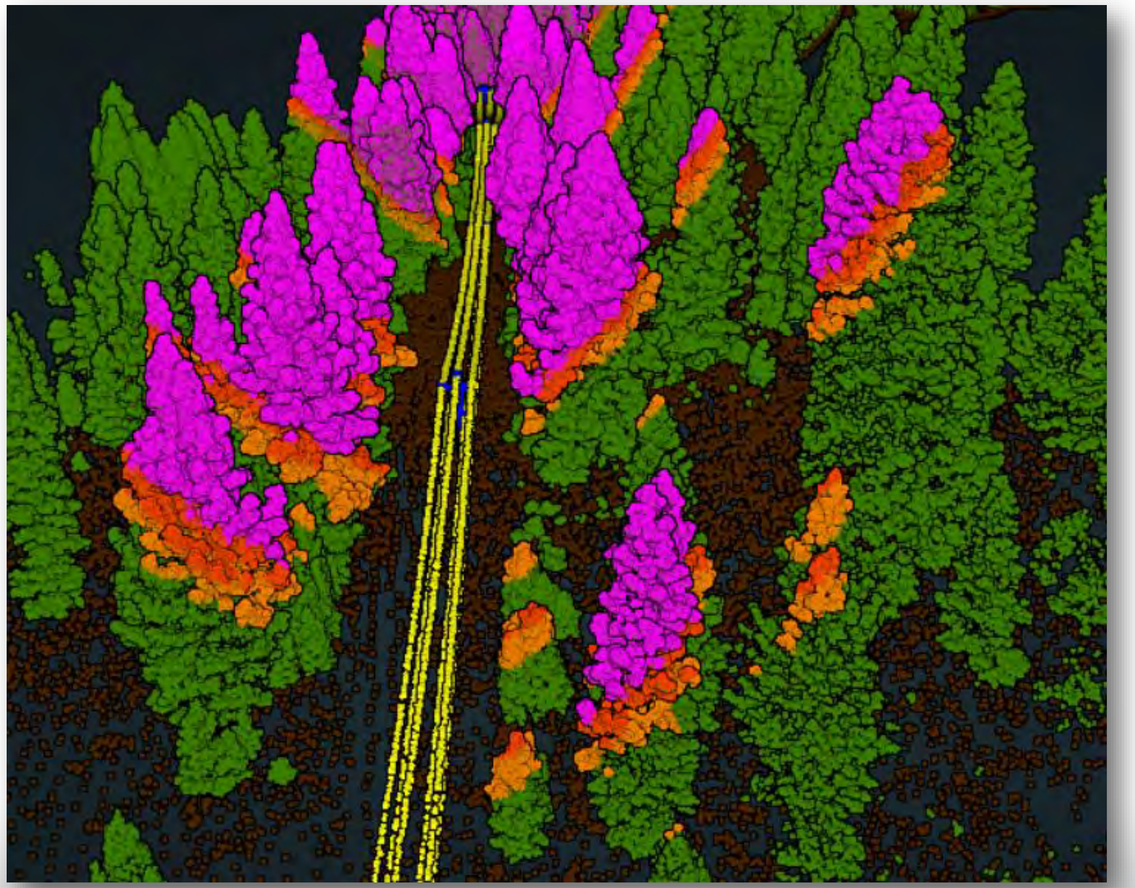
Grow - In Encroachment Categories: At the time of flight, vegetation was encroaching on a primary wire:		
Voltages	Zone	Description
14.4 kV Distribution and 60 kV Transmission	1	Within < 1.5 ft
	2	1.5 ft - 4 ft
	3	4 ft - 6 ft
	4	6 ft- 12 ft
Voltages	Zone	Description
120 kV Transmission	1	Within <1.5 ft
	2	1.5 - 10 ft
	3	10 - 15 ft
	4	15 - 30 ft

Encroachments – Grow-in, Fall-in, Overhang

- Distribution and Transmission
- As-Surveyed conditions
- Unique Tree ID associated with threat
- Attributes in the vegetation clearance threat GDB
- Based on distance to wire and voltage

Fall-In and Overhang Encroachment Categories: At the time of flight, vegetation was encroaching on a primary wire:		
Voltages	Zone	Description
14.4 kV Distribution and 60 kV Transmission	1	Overstrike > 6 ft of wire
	2	Overstrike 0- 6 ft of wire
	3	Fall within 6 ft of wire
Voltages	Zone	Description
60 kV and 120 kV Transmission	OH	1 ft upwards on conductor

Building the Program – Timeline



Project Timeline

Q3 – Data collection

Q3 – Rapid reporting within 2 weeks of collection

Q4 – Final deliveries

Q4 – Desk top reviews & work orders generated

Q1/Q2 – Issue work orders to crews

Q2 – All tree work completed

Q3 – Data collection

Building the Program – Inspection - Operationalization

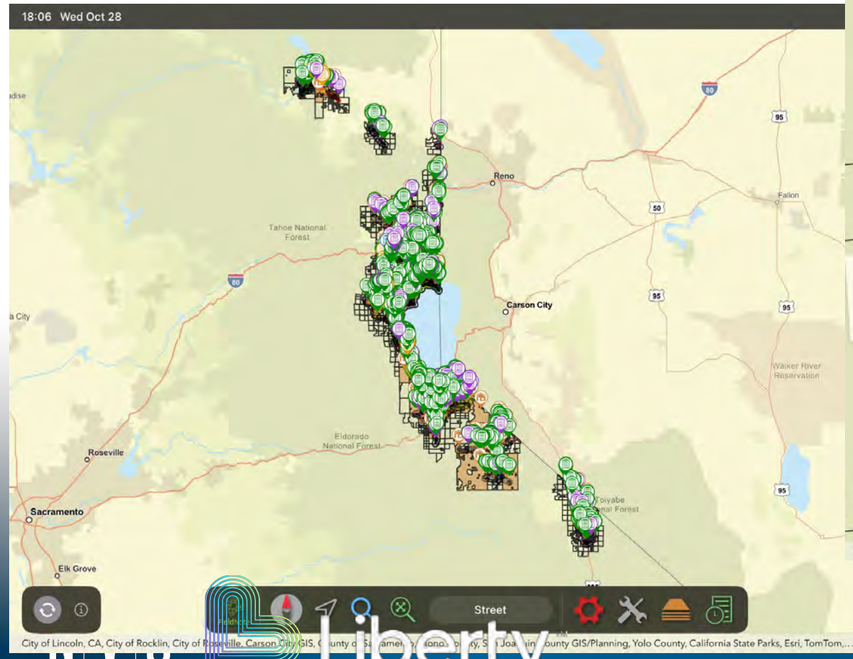
What happens once data is delivered.....

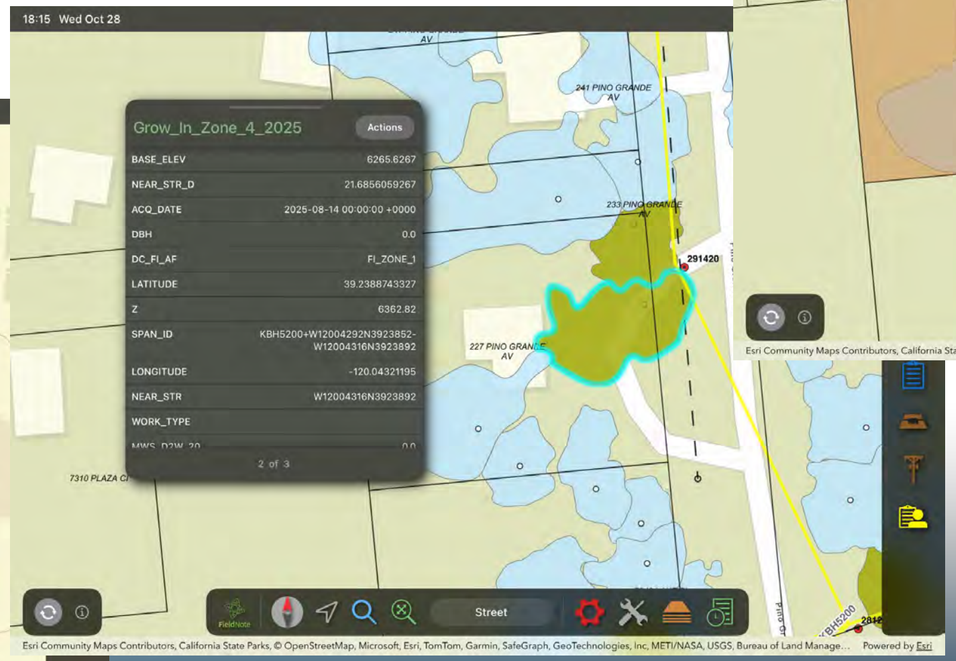
- Lidar data delivered and hosted in ENVI Discover software platform

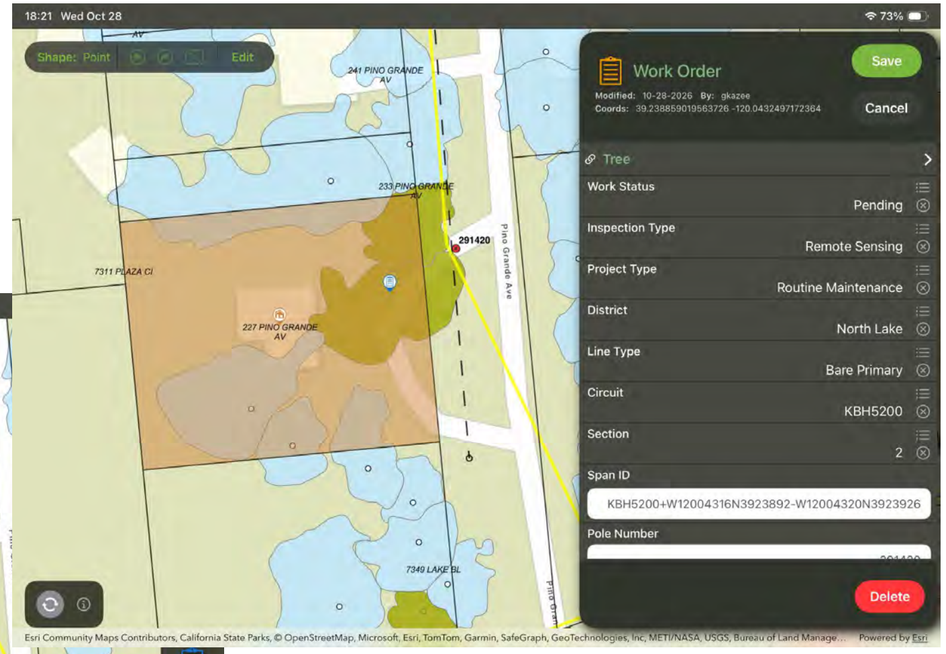
  Desktop review performed on all detections
  Spreadsheet generated for detections

- All trees uploaded into work management system

  Detections identified
  Initiate work order packets to crews







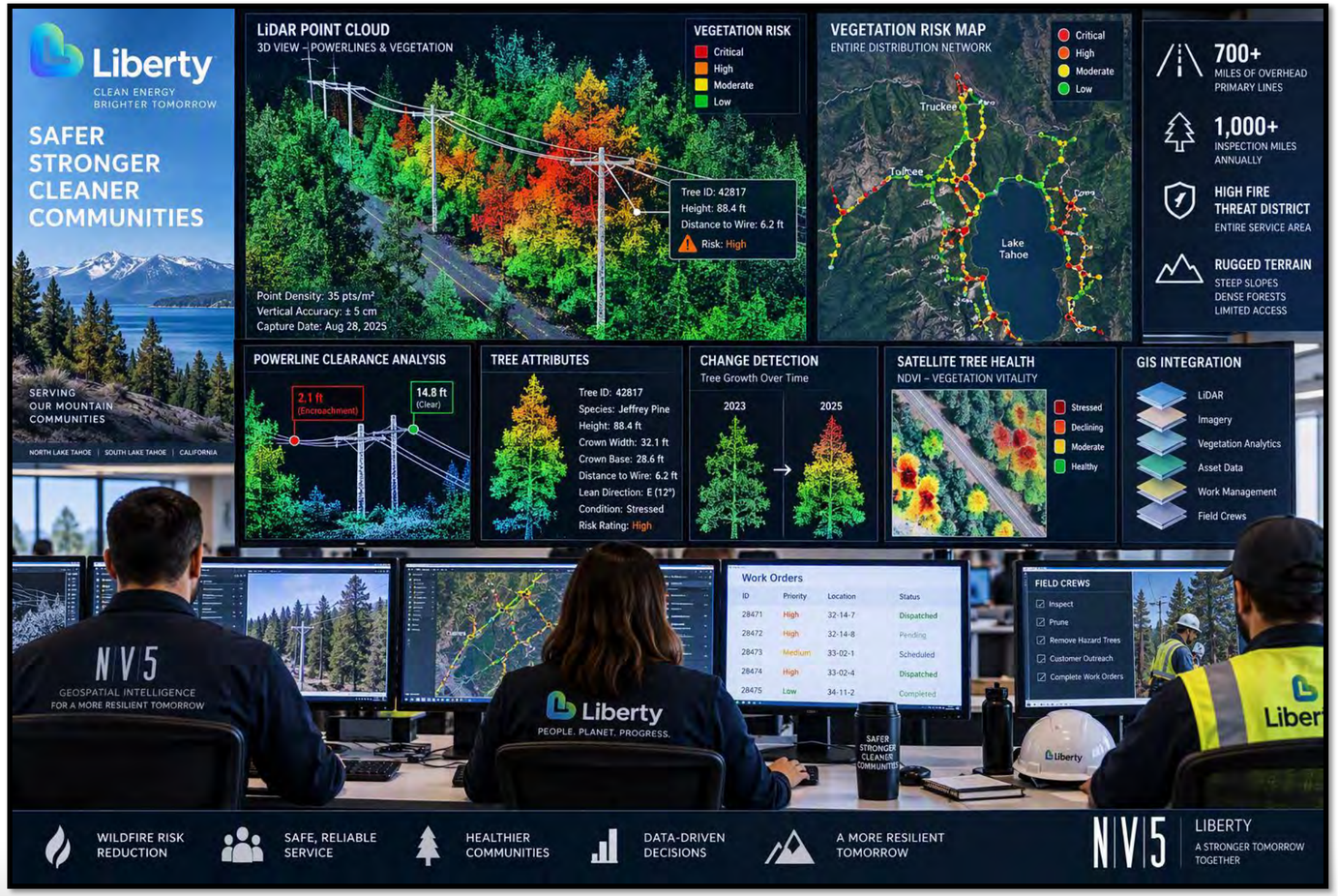
Operational Improvements

Before

- Broad patrol-based identification
- Reactive work planning
- Lengthy schedule

After

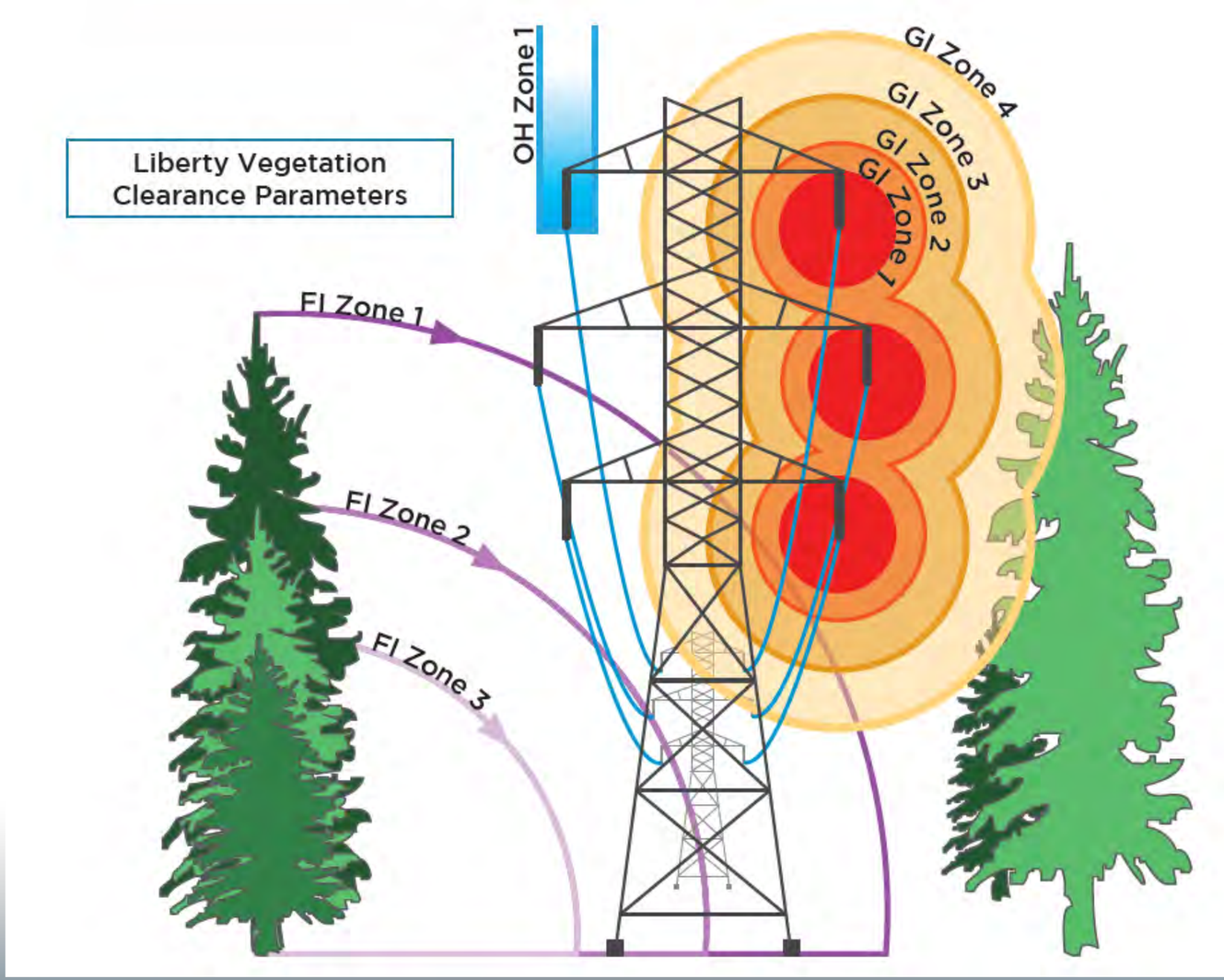
- Data driven prioritization
- Inspection scope grew from 383 to 1,000+ mi/yr
- Targeted field operations
- Reduced unnecessary field visits



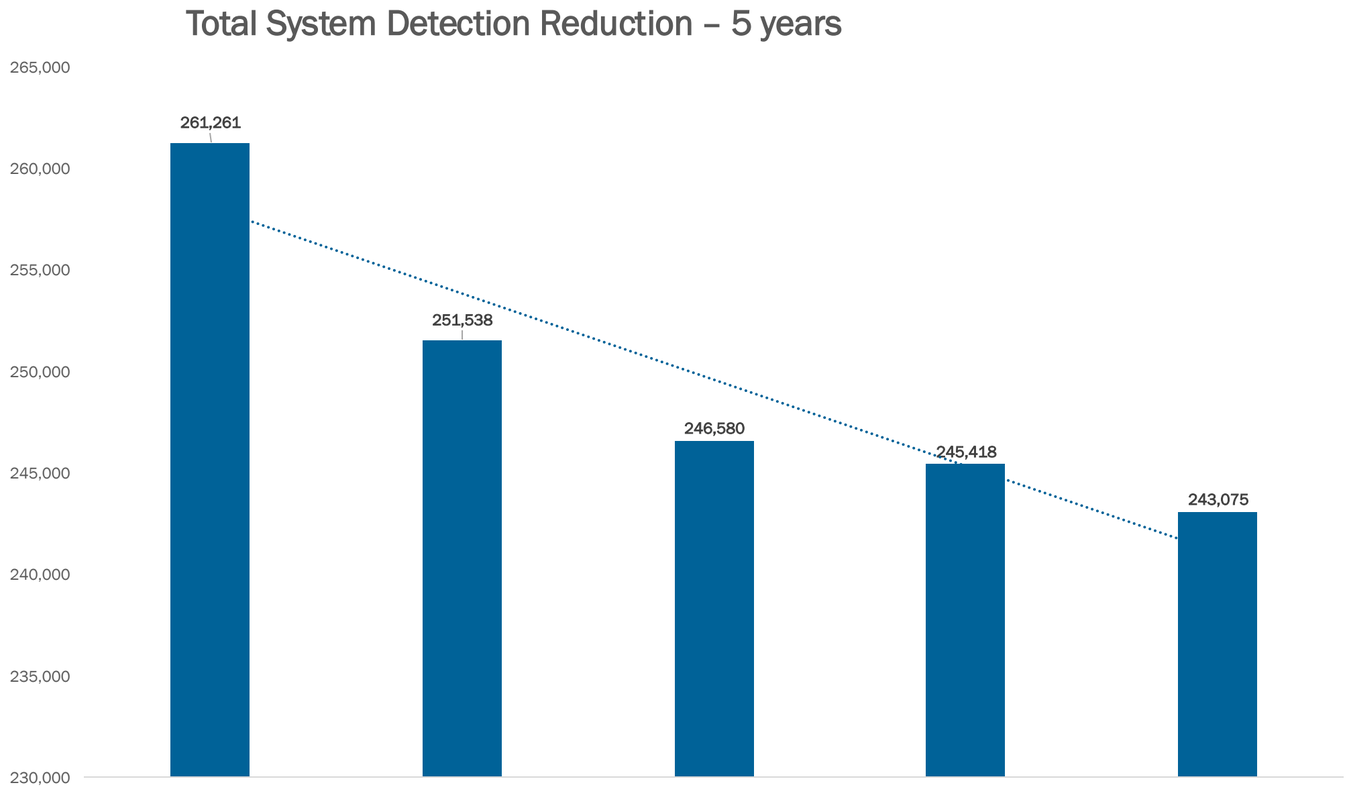
Crews spend more time mitigating risk and less time searching for it

System-wide Clearance Results – Improved Clearances

- Zone 1: Critical Zone
  - *87% reduction*
- Zone 2: Regulated Zone
  - *89% reduction*
- Zone 3: Maintenance Zone
  - *62% reduction*
- Zone 4: Outside Maintenance
  - *27% increase*
- Average Distance to Wire
  - 7% increase on distribution
  - 109% increase on transmission

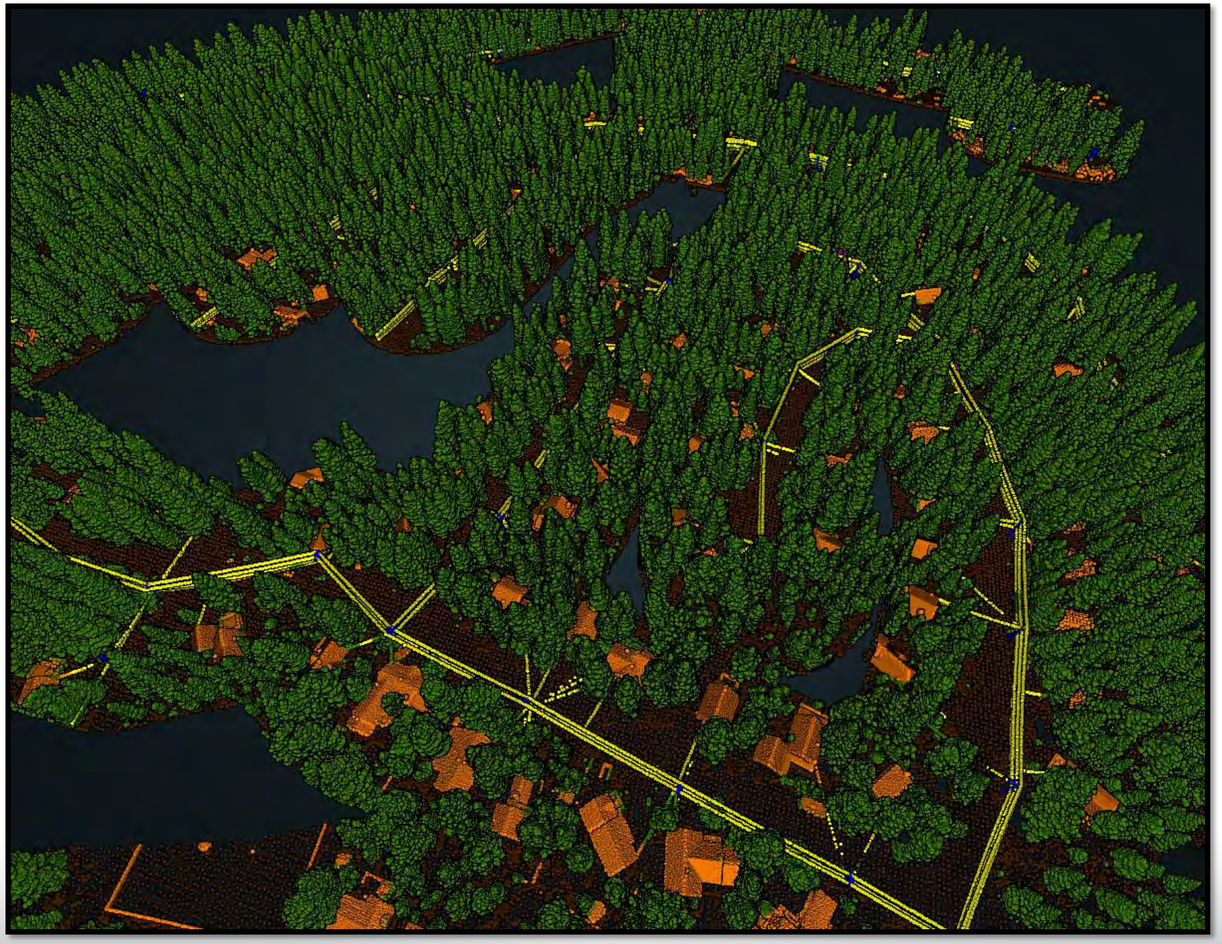


System Results



All Circuits	2021	2022	2023	2024	2025
Total Fall In Trees	253,641	247,136	244,385	243,102	240,935
Total Encroachments	7,620	4,402	2,195	2,316	2,140
Total Detections	**261,261**	**251,538**	**246,580**	**245,418**	**243,075**

Building a Defensible Wildfire Program – Transparency Through Accurate Data



- Auditable inspection records
- High accuracy vegetation measurements
- Consistent annual monitoring
- Repeatability
- Data supported management decisions
- Enhanced communication with customers, regulators and stakeholders

Accurate geospatial data creates confidence and accountability

NV5 Liberty

Lessons Learned

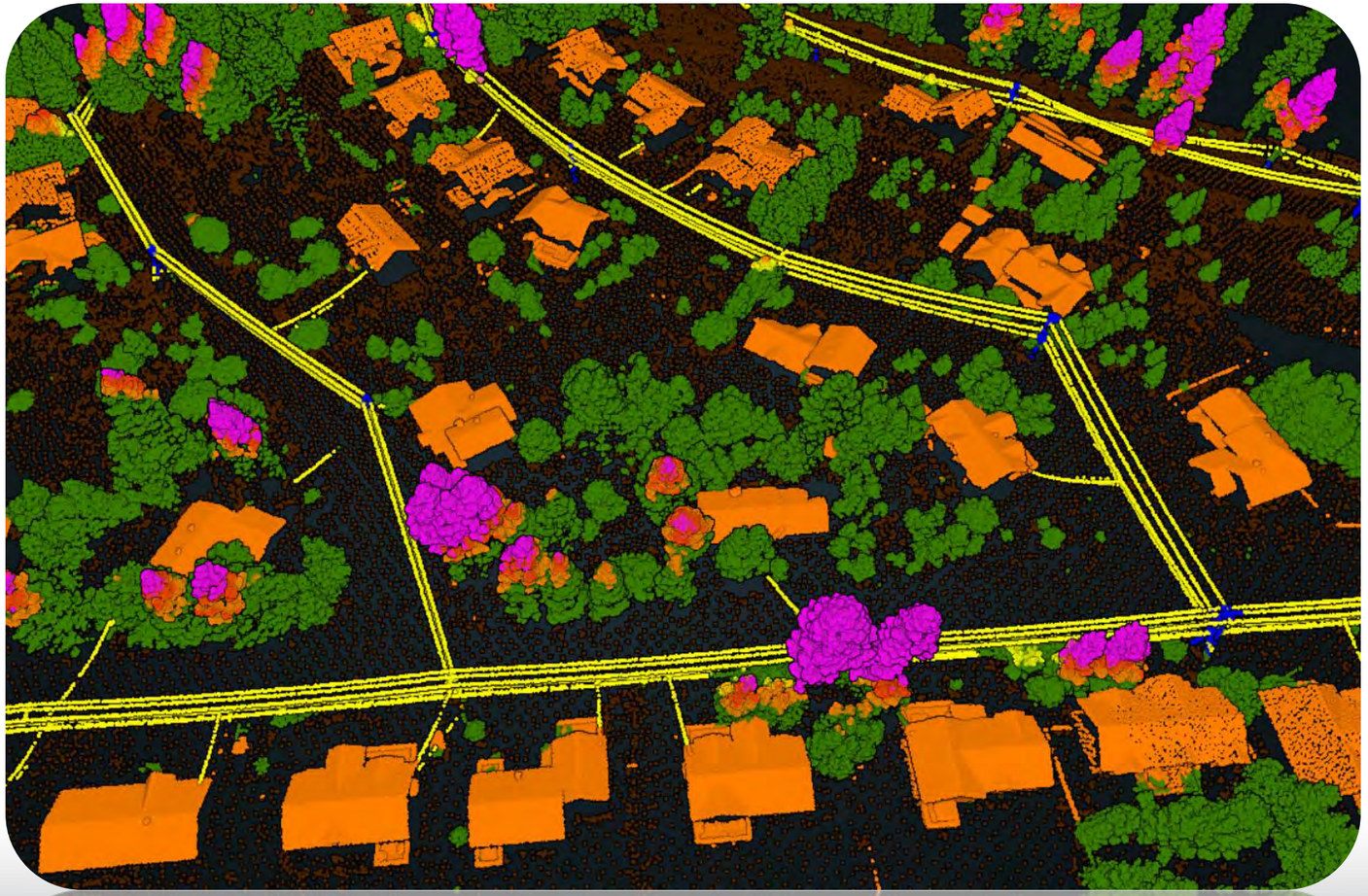
Technology is most valuable when directly connected to operational decisions

Commit to repeatable annual data collection	
Be open to data, one technology isn't always best fit.	
Focus on actionable analytics	
Prioritize risk-based decision making	
Build a workflow around measurable outcomes	
Supplements ground-based inspections	Does not replace need for qualified utility arborists Allows arborists to focus on hazard tree assessments, unit reduction, and customer service

Replicating Success Across Distribution Networks

Applications for Utilities facing:

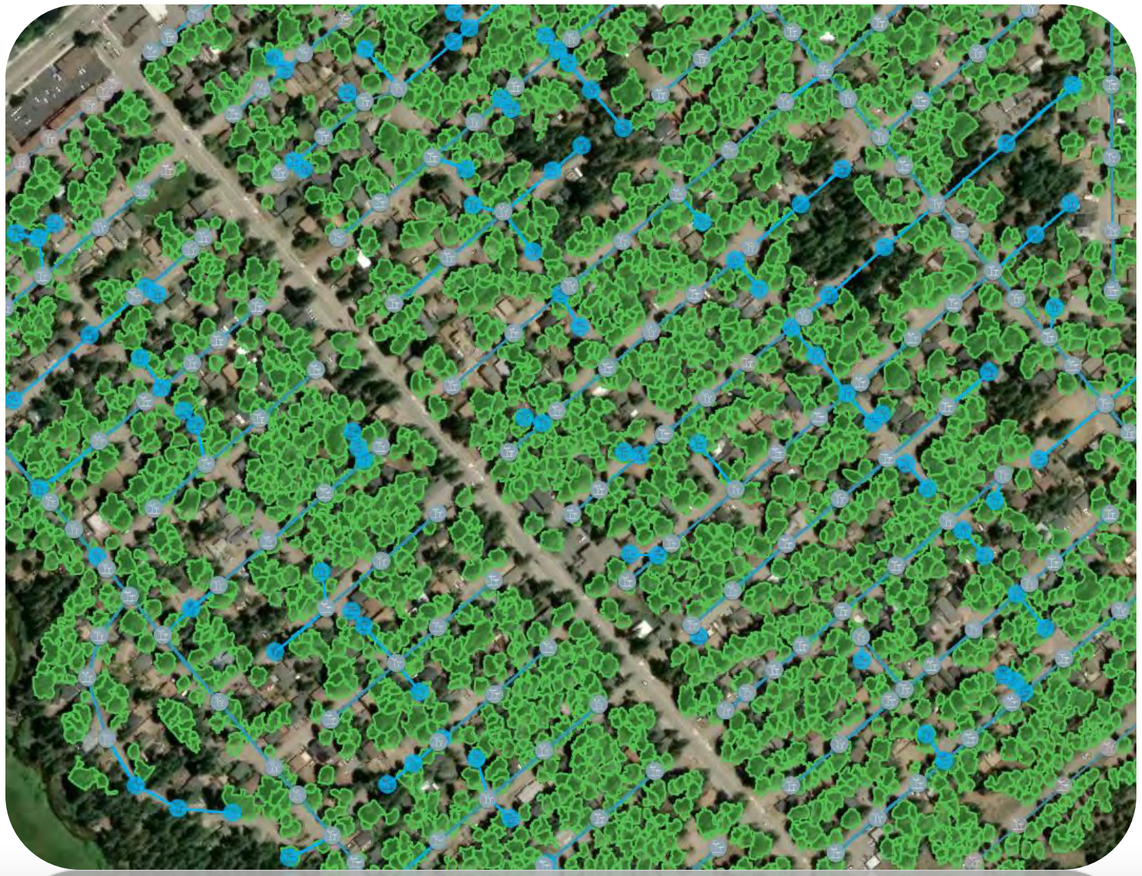
- Wildfire risk
- Difficult terrain
- Workforce constraints
- Regulatory scrutiny
- Timelines – schedule / efficiencies



Why it works:

- Scalable
- Cost-effective
- Repeatable
- Defensible

Takeaways



- Increased Operational Safety
- Improved prioritization of work
- Faster risk mitigation
- Data repeatability
- Scalable model for utilities
- Decreased Costs
- Decreased schedule
- Decreased maintenance workload

Inspection scope grew from 383 to 1,000+ miles/year

- **Ground: ~$1,983/mile**
- **LiDAR: ~$773/mile**


Thank You



ANSI Update
A 300

Presented by:

Bob Bell, Asplundh

rbell19@utilitytreeservice.com



ANSI A300 Tree Care Standards

Overview and Discussion of Selected Clauses and Significant Additions

UAA Western Regional Meeting 2026

Stateline, NV

Bob Bell
Director, Industry Engagement
Email : RBell19@Asplundh.com
Ph : 980-418-6317
Asplundh.com



Clauses 1-4: General Requirements

Scope, purpose, safety, references, and the General clause that applies to every part of the standard

Clause 5: Pruning

Pruning standards for trees, shrubs, palms, and other woody plants

Clause 11: Integrated Vegetation Management

Managing plant communities on utility, roadside, and natural-area sites

A Brief History: From ten parts to one standard

1995

Part 1 Pruning published as the first A300 standard

1998-2016

Parts 2-10 added: soil, support systems, lightning, construction, planting, IVM, roots, risk assessment, IPM

2023

Ten parts consolidated into one document with consistent terms, structure, and a flowchart per clause

Ongoing

ASC A300 meets regularly; drafts go out for public comment and every comment is considered

Old parts, new clauses

A300-2023

ANSI A300 Parts (before 2023)

- Part 1 Pruning
- Part 2 Soil Management
- Part 3 Supplemental Support Systems
- Part 4 Lightning Protection
- Part 5 Site Planning, Development & Construction
- Part 6 Planting & Transplanting
- Part 7 IVM
- Part 8 Root Management
- Part 9 Tree Risk Assessment
- Part 10 IPM

A300-2023 Clauses

- Clauses 1-4 Scope, Purpose, Safety, References, General
- Clause 5 Pruning
- Clause 6 Soil Management
- Clause 7 Supplemental Support Systems
- Clause 8 Lightning Protection Systems
- Clause 9 Site Development & Construction
- Clause 10 Planting & Transplanting
- Clause 11 IVM
- Clause 12 Root Management
- Clause 13 Tree Risk Assessment
- Clause 14 IPM
- Clause 15 Definitions

Session roadmap – Clause 1-4

1 What A300 is

Voluntary, industry-consensus performance standards and who writes them

2 Standards vs. specifications

How A300 relates to specifications, BMPs, and ANSI Z133

3 Clauses 1-3

Scope, purpose, application, safety, and normative references

4 Clause 4 General

Inspection, objectives, specifications, work practices, tools, monitoring

5 Putting it to work

Proposals, disclaimers, and specification writing

6 Key terms

Shall, should, may, and other Clause 15 definitions

Standards, specifications, BMPs, and Z133 (from Clause 15)

ANSI A300 standard

Performance parameters set by consensus: the rule used to write specifications

Work specification

A detailed, measurable plan or proposal for a specific job

ISA Best Management Practices

Interpret the standards and explain how to meet them

ANSI Z133

Safety requirements for arboricultural operations

Clause 1: Scope, purpose, and application

- Covers the care and management of trees, shrubs, palms, and other woody landscape plants (1.1)
- Intended for developing specifications, best practices, regulations, etc. (1.2)
- Not intended to be adopted in their entirety without additional information (1.2.1)
- Applies to **any person or entity** managing woody plants (1.3)
- **Shall not** apply to commercial agriculture, horticultural production, or silviculture unless referenced (1.3.1)

Clause 2: Safety

- Does not supersede existing Safety Standards, Rules, Laws, Regs, etc.

Clause 3: Normative References

- ANSI Z133, OSHA Regs, Environmental Laws, Etc.

Objectives and specifications (4.3-4.4)

A300 4.3

Objectives (4.3.1)

One or more objectives **shall** be specified, as detailed in each clause

Specifications first (4.4.1)

Work specifications **shall** be developed before proposing or starting any tree care operation

Who writes them (4.4.2)

Specifications **should** be written and administered by an arborist or other qualified professional

Who does the work (4.4.3)

Operations **shall** be performed by arborists or qualified professionals familiar with A300 practices and hazards

Writing specifications: general instructions

1 Cite the standard

"All work **shall** be performed according to ANSI A300 tree care standards in effect on the date of this proposal."

2 Be measurable

Clearly detailed with measurable criteria; can be used to confirm compliance for payment

3 Requirements, not how-to

List requirements; leave out recommended operations or how-to guidance

4 State objectives

Objectives communicate the goal to sales, production staff, and the client

5 Fit your business

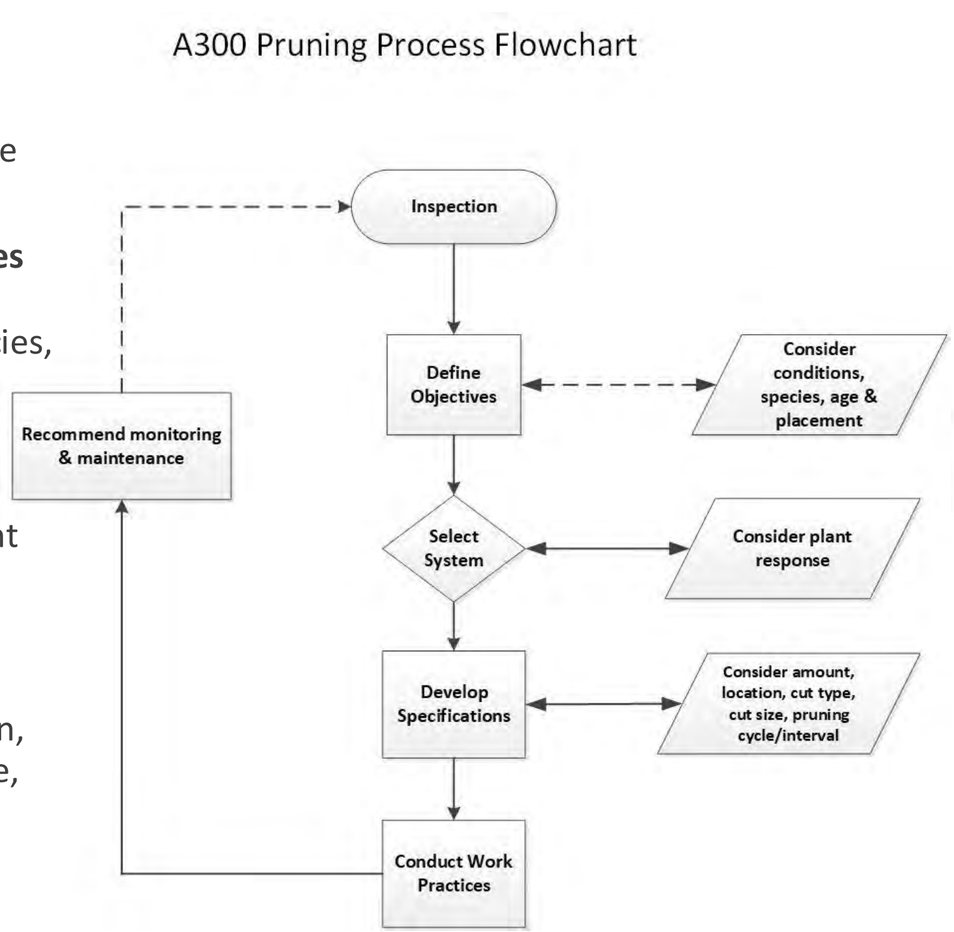
Simple or complex, in a format that suits your company, the job, and the client

6 Plan follow-up

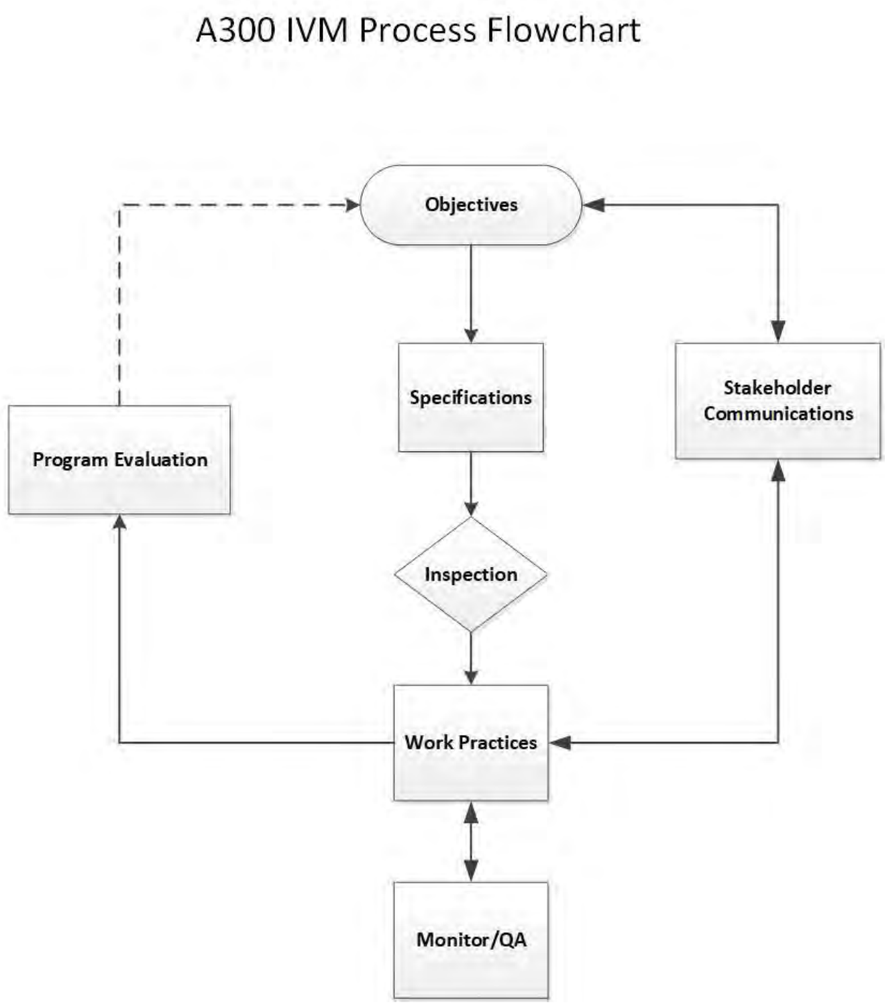
Include maintenance recommendations; the client schedules monitoring and maintenance

Pruning process flowchart (Project)

- **Inspection** of the plant and site
- **Define objectives** considering conditions, species, age, and placement
- **Select system** considering plant response
- **Develop specifications**: amount, location, cut type and size, pruning cycle
- **Conduct work practices**
- **Recommend monitoring & maintenance**



IVM process flowchart (Program)



- Set **objectives**; engage **stakeholders**
- Develop **specifications**
- **Inspection** against action thresholds
- **Work practices** (treatment methods)
- **Monitor / QA**
- **Program evaluation** feeds back into objectives

Key terms (Clause 15)

A300 15

shall

Denotes a mandatory requirement

should

Denotes an advisory recommendation

may

Denotes permission

arborist

An individual who, through experience, education, and training, can provide for or supervise the management of trees and other woody plants

qualified professional

Trained and experienced to perform assignments safely and effectively; credentialed where required by law

specifications

A document stating a detailed, measurable plan or proposal for a product or service

Key takeaways – Clauses 1-4

- A300 is a voluntary consensus standard, not a specification; add measurable, site-specific criteria
- Clause 4 General applies to every clause
- Inspection before specifying work is **not** a tree risk assessment
- Objectives and written specifications come before work
- Recommend monitoring; scheduling is the client's responsibility



Session roadmap – Clause 5 Pruning

1 Process & inspection

The Clause 5 flowchart and what must happen before work starts

2 Objectives & systems

Why we are pruning, and the long-term form we are working toward

3 Specifications

What a pruning specification **shall** and **should** include

4 Pruning practices

Cut types, work practices, and unacceptable practices

5 Palms, bamboo & emergencies

Plant-specific and situation-specific requirements

6 Monitoring & writing specs

Follow-up care, client responsibility, and a sample specification

Pruning objectives

A300 5.3.1

Manage risk

See Clause 13 Tree Risk Assessment and Clause 7 Support Systems

Manage health

See Clause 6 Soil Management and Clause 14 IPM

Develop structure

Branch and trunk architecture, spacing, directional pruning, restoration, rejuvenating shrubs

Provide clearance

Utility reliability, traffic, lines of sight, access, regulatory compliance

Improve aesthetics

Visual appearance of the plant and site

Manage size or shape

Maintain a desired form or size

Manage production

Fruit, flowers, or other products (see 1.3.1 exceptions)

Manage wildlife habitat

Retain or enhance features that do not pose unacceptable risk

Pruning system requirements

A300 5.3.3

Natural

- **Should** maintain characteristic growth habit and adaptations
- Allows changes in appearance to meet objectives (reduction, raising, clearance, structure)

Pollarding

- **Shall not** be initiated on mature trees
- A plan **shall** be made for periodic shoot removal
- Shoots removed at intervals of 3 years or less

Topiary

- Shape **should** be determined and specified before pruning
- Selective pruning and shearing as needed

Espalier

- Planar form; branches outside the plane pruned or tied back
- Ties **shall** be replaced or adjusted to prevent girdling

Pleaching

- Pruning, interweaving, and tying to each other or a frame
- Ties **shall** be replaced or adjusted to prevent girdling

All systems

- Plants **should** be of appropriate size, species, and age
- Existing pollards **should** be maintained as pollards

Pruning specifications

A300 5.4

Shall include (5.4.1)

- Physical location of the plants
- Pruning objectives
- Type of parts to be removed (living or dead branches, fruit, mistletoe)
- Plan for removal, disposal, or repurposing of by-products

Should include (5.4.2)

- Pruning system
- Pruning cut types
- Estimated amount (percent range, number of branches)
- Size range of parts to be removed
- Location in crown (images or figures)
- Other: time frame, clearance distances, views, hazards

Wound treatment and mechanical cutting

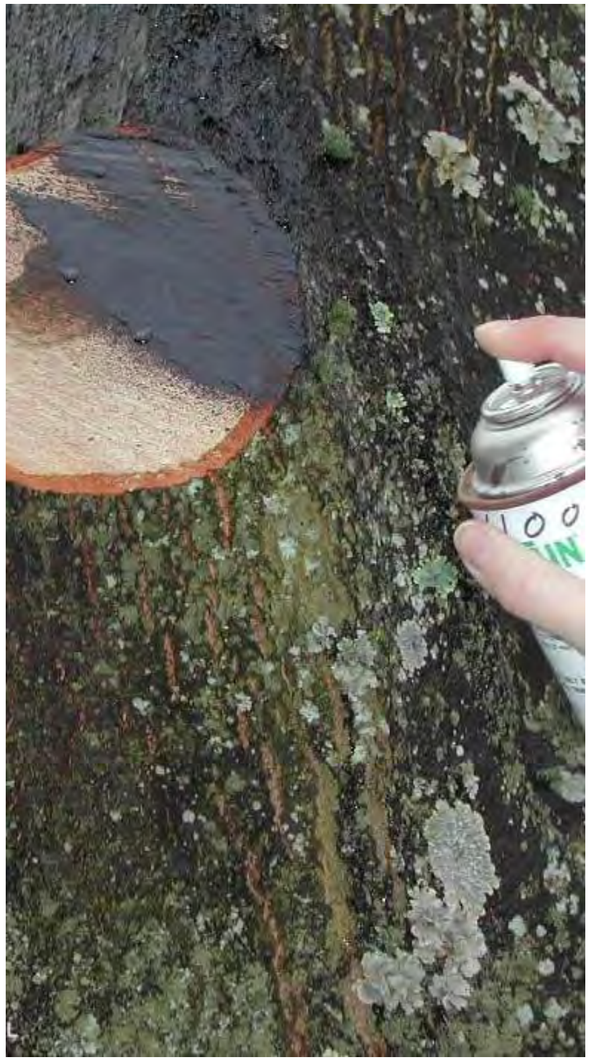
A300 5.5.18

Wound treatment (5.5.18)

- **Should** be used only to prevent the spread of pests or for other specified reasons
- Treatments that damage the plant **shall not** be used
- Damaged bark: only loose or damaged tissue **shall** be removed

Mechanical branch cutting (5.5.22)

- Cuts **should** avoid stem wounding and be made outside the branch collar and ridge
- Mastication **shall not** be considered an acceptable branch-cutting practice



Bamboo, emergencies, and by-products

A300 5.7

Bamboo (5.7)

Culms and branches **shall** be pruned with cuts just above nodes, without leaving a stub

Emergency pruning (5.8)

Exemptions to non-safety clauses are allowed when services must be restored; restoration pruning **should** be considered afterward

By-products (5.9)

A plan **shall** be specified; disposal **shall** comply with regulations and quarantines; repurposing **should** be preferred

Writing a pruning specification

Annex A-1

1 Cite the standard

"All work **shall** be performed according to ANSI A300 tree care standards in effect on the date of this proposal."

2 State objectives

Clear objectives let sales, crew, and client picture the same result

3 Make it measurable

Location, parts, cut types, amounts, sizes, clearances

4 Skip the how-to

List requirements, not instructions on how to perform the work

5 Plan follow-up

Include maintenance recommendations and client scheduling responsibility

Key takeaways

Clause 5

- Inspect first; the inspection is **not** a tree risk assessment
- Every job needs one or more **objectives**; specify a **system** for long-term form
- Specifications **shall** include location, objectives, parts removed, and a by-products plan
- Remove no more living material than necessary; flush cuts, topping, lion tailing, and mastication are unacceptable
- Recommend monitoring; scheduling is the client's responsibility



Session roadmap – Clause 11 IVM

1 IVM process

A program cycle, not a single job

2 Objectives & plans

Program objectives and management plans

3 Specifications

Site evaluation, thresholds, and methods

4 Practices

Right of use, stakeholders, thresholds, and treatment methods

5 Application

Management units and site-specific treatment

6 Monitoring

Evaluation, records, and adaptive management

IVM objectives

A300 11.3.1

Reliability & safety

Maintain or improve utility service reliability; enhance public and worker safety

Compliance

Comply with regulations; control noxious weeds and invasive species

Access & sight lines

Provide access to sites; ensure lines of sight or desired views

Wildfire

Reduce risk of wildfire

Ecology

Manage pollinator and wildlife habitat; restore ecological benefits

Cost & aesthetics

Reduce maintenance costs; improve aesthetics

IVM specifications

A300 11.4

Shall include (11.4.4)

- IVM objectives
- Location of treatment sites
- Site characteristics **shall** be evaluated (11.4.2): access, adjacent land use, cultural resources, vegetation, growth rates, fire risk, past treatments, sensitive species, soils, topography, water

Should include (11.4.5)

- Action thresholds and tolerance levels
- Methods and treatments
- Time frame for completion
- Recordkeeping process
- Other: container recycling, sensitive sites, stakeholder engagement

Right of use and stakeholders

A300 11.5.1

Right of use (11.5.1)

The right to use IVM methods on lands, sites, and facilities **shall** be established (easement, fee simple, license, agreement)

Stakeholders (11.5.2)

Internal and external concerns **shall** be considered when setting objectives and evaluating options; communication **should** be proactive



IVM treatment methods

A300 11.5.4

Biological

Compatible plant communities, allelopathy, and wildlife suppress incompatible species; preferred as a long-term strategy

Chemical

Herbicides and tree growth regulators; applied per label; reduce amounts and resistance over time

Cultural

Seeding, compatible landscapes, grazing; prescribed fire where appropriate

Physical

Manual for selective removal; mechanical for non-selective cutting or dense stands

Wire zone / border zone

Annex A

- **Wire zone:** low-growing grasses, forbs, and low shrubs under and near conductors
- **Border zone:** shrubs and small trees that never reach action thresholds
- Compatible communities act as biological controls and habitat

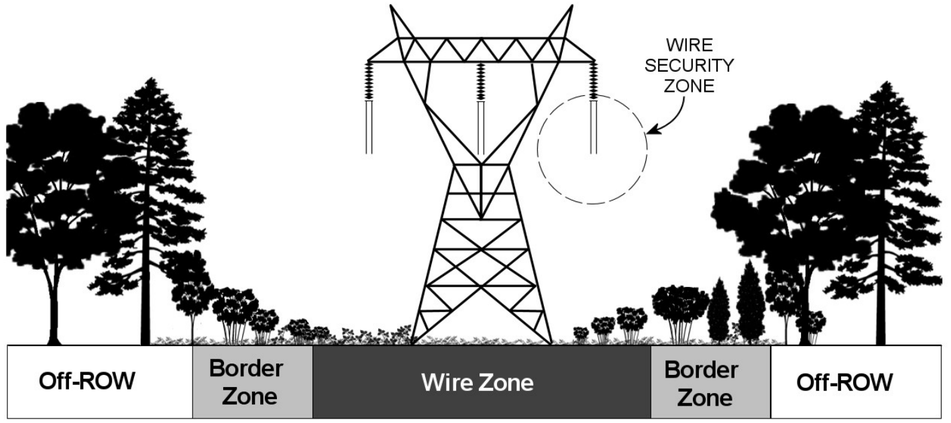


Fig. A-1 Wire zone - border zone

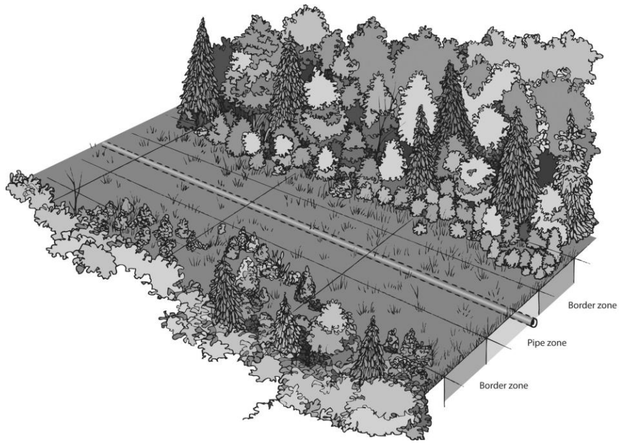


Fig. A-2 Pipe-border zone

Key takeaways

Clause 11

- IVM is a program: objectives, plans, thresholds, treatment, evaluation
- Establish right of use and engage stakeholders
- Set tolerance levels and action thresholds; never reach tolerance
- Prefer selective methods and biological controls
- Evaluate after treatment and keep records





Questions?

ANSI A300 standards, resources, and public comment:
tcia.org/a300

UAA Western Regional Meeting 2026, Stateline, NV

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POWERING THE FUTURE

Bob Bell
Director, Industry Engagement
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Ph : 980-418-6317
Asplundh.com

Wildfire Environmental Talk

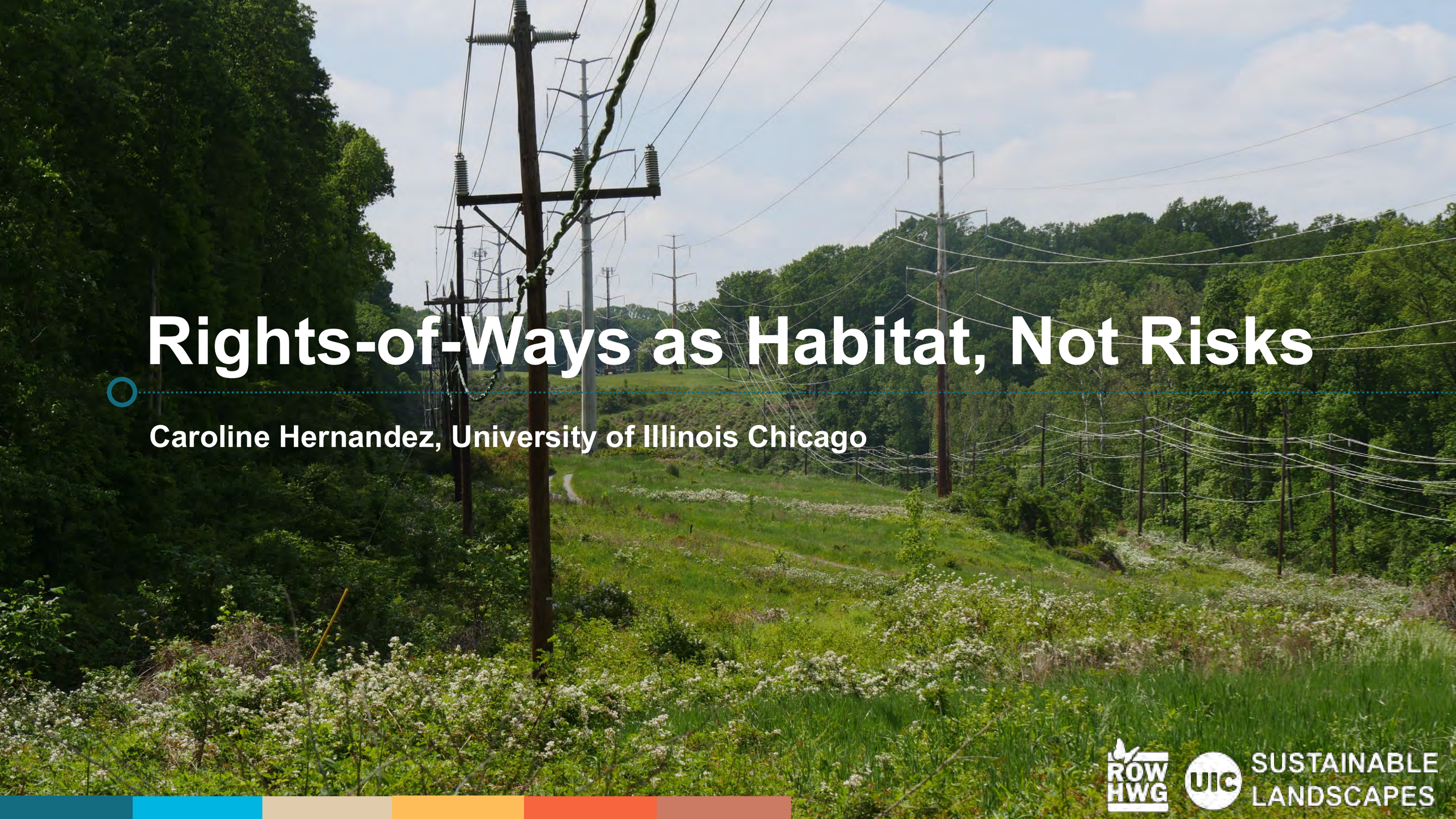


Presented by:

Caroline Hernandez,

University of Illinois Chicago

cah272@uic.edu



Rights-of-Ways as Habitat, Not Risks

Caroline Hernandez, University of Illinois Chicago

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UIC SUSTAINABLE LANDSCAPES

Who is the Working Group?



400+ Organizations

2500+ Individuals

2 Countries

Managing Energy and Transportation Lands

From Risk…

- Ongoing maintenance costs
- Safety and security concerns
- Public perception concerns around right-of-way management
- Compliance related to ESA, NEPA, FERC, NERC

To Asset…

- Reduced maintenance costs
- Reducing safety and compliance risks
- Demonstrating environmental stewardship and sustainability
- Improving public perception of vegetation management

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Impacts of the Working Group

Building Connections
Meetings, workshops, and roundtables



gROWing Chicago Habitat





Creating and Connecting Resources
Conservation agreements, interactive tools, and freely available resources

Nationwide CCAA for MONARCH BUTTERFLY

Nationwide AGREEMENT for AT-RISK BUMBLE BEES







Conducting Research
Industry-led and collaborative



phase
pollinator habitat aligned with solar energy



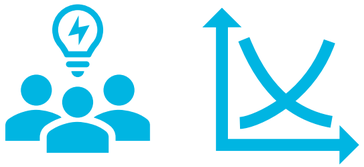




Communications
Publications, webinars, presentations



Technical Support
Analysis, research dissemination, facilitation, and support



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Pollinator Scorecard

- A **common language** to describe habitat on energy and transportation lands
- **Consistent valuation method** across industry sectors
- **Flexible**, multi-tiered tool
- Supports both **voluntary and compliance reporting**



Source: Dan Salas

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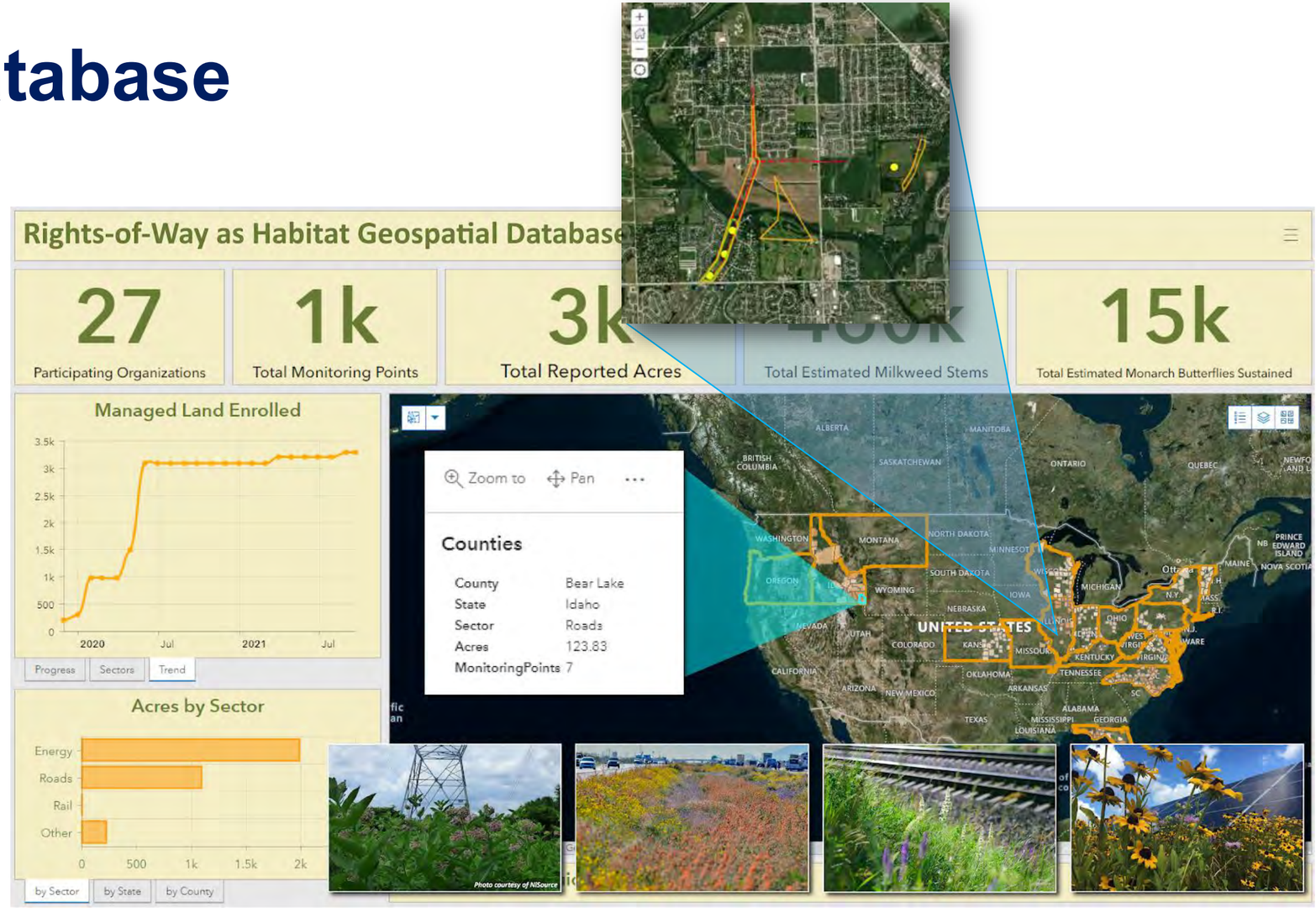
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Geospatial Habitat Database

An online ESRI-based geospatial habitat repository that helps:

- Facilitate easier data collection
- Maintain long-term records
- Document habitat values
- Inform tracking efforts

Future updates will integrate geospatial tools and data overlays.



FIELD ROW HWG UIC SUSTAINABLE LANDSCAPES

Nationwide Conservation Agreements

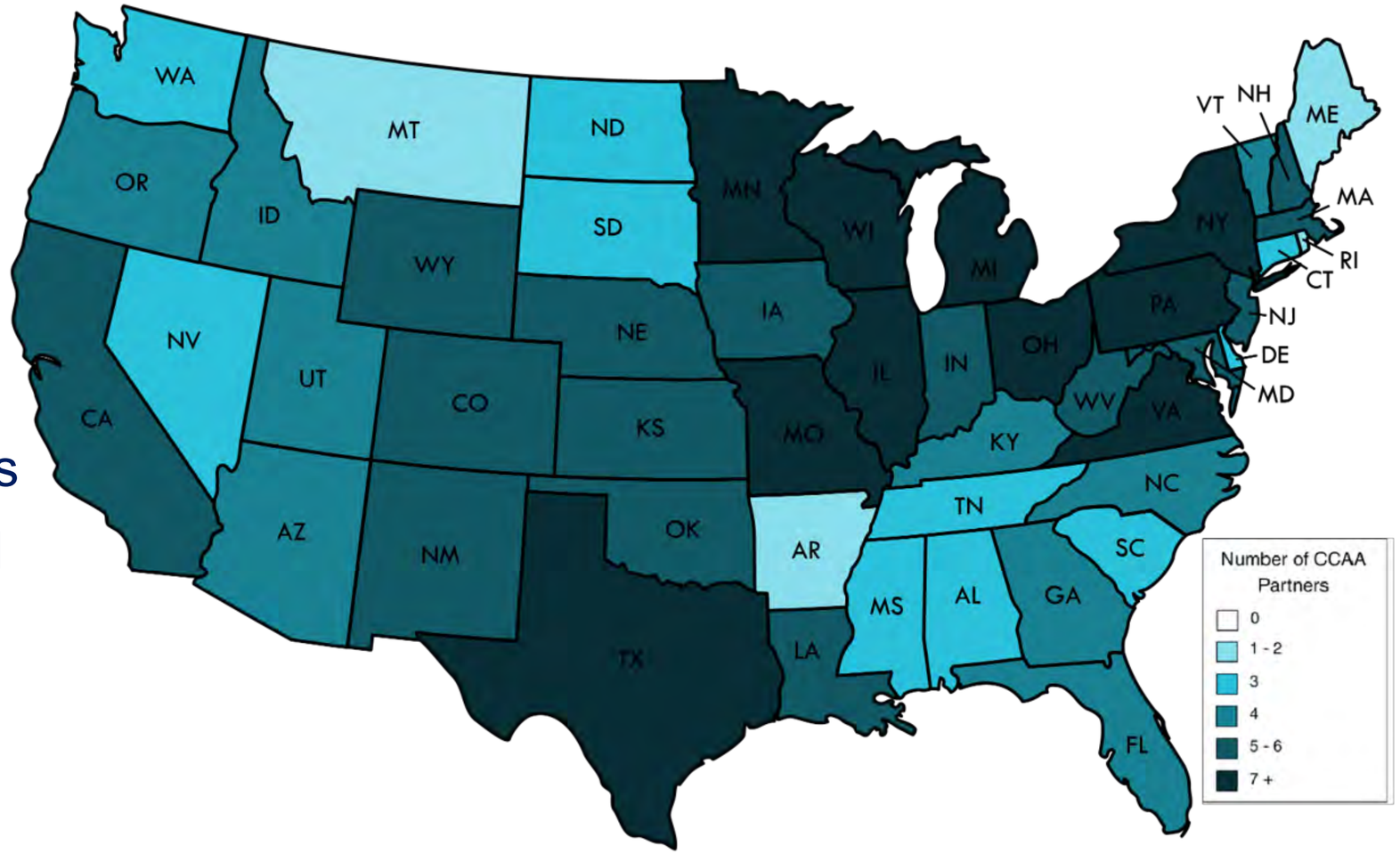
Agreement	Nationwide CCAA for MONARCH BUTTERFLY	Nationwide AGREEMENT for AT-RISK BUMBLE BEES
Species included	1	11
Authorized since	April 2020	Anticipated 2025
Enrollment period	Only open while a candidate species	Open for both listed and candidate species
Approach	Leverages industry best practices for vegetation management	Leverages industry best practices for vegetation management, plus engagement in research and partnerships
Take coverage	Operations, maintenance, and modernization activities	Operations, maintenance, and modernization activities

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Nationwide CCAA for MONARCH BUTTERFLY

Since approval in April 2020:

- **108 applicants across 48 states**
  - 60 energy sector partners
  - 48 transportation agencies
- More than 9.3 million enrolled acres
- **Over 1.3 million adopted habitat acres committed**

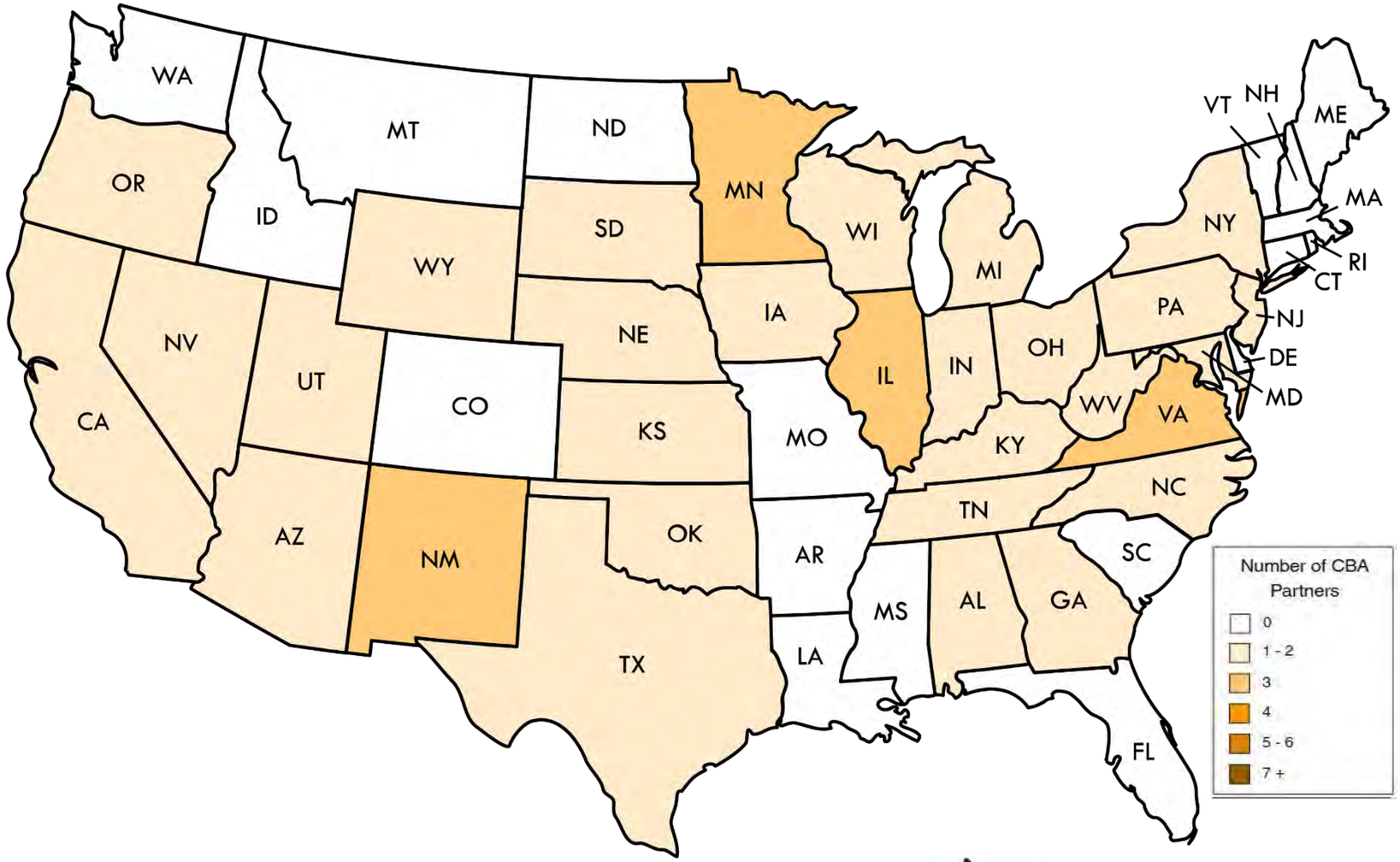


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Nationwide AGREEMENT for AT-RISK BUMBLE BEES

Since approval in June 2026:

- **9 applicants across 30 states**
  - 8 energy sector partners
  - 1 transportation agency
- 356,584 enrolled acres



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Pollinator Habitat at Large-Scale Solar

- Research **scalability** and **configuration** of pollinator plantings at facilities >10 MW
- Evaluate **ecological**, **economic**, and **performance** impacts of pollinator plantings
- Create comprehensive **implementation guidance** and **decision tools** for solar developers and policy-makers



Photo courtesy of Guy Parker

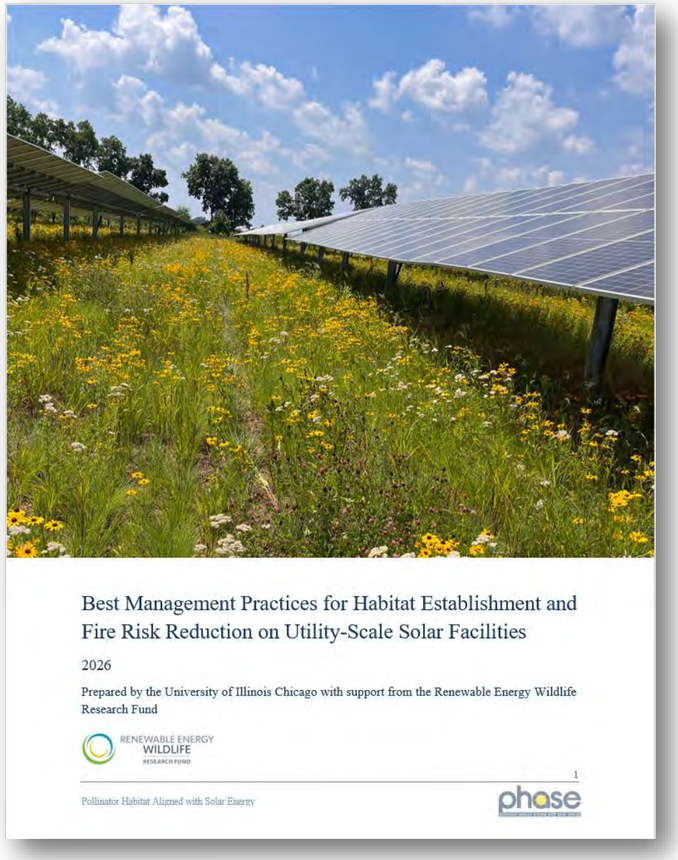
SOLAR ENERGY TECHNOLOGIES OFFICE
U.S. Department Of Energy

About the Solar Energy Technologies Office
The U.S. Department of Energy Solar Energy Technologies Office supports early-stage research and development to improve the affordability, reliability, and domestic benefit of solar technologies on the grid. Learn more at energy.gov/solar-office.

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Fire Mitigation & Best Management Practices



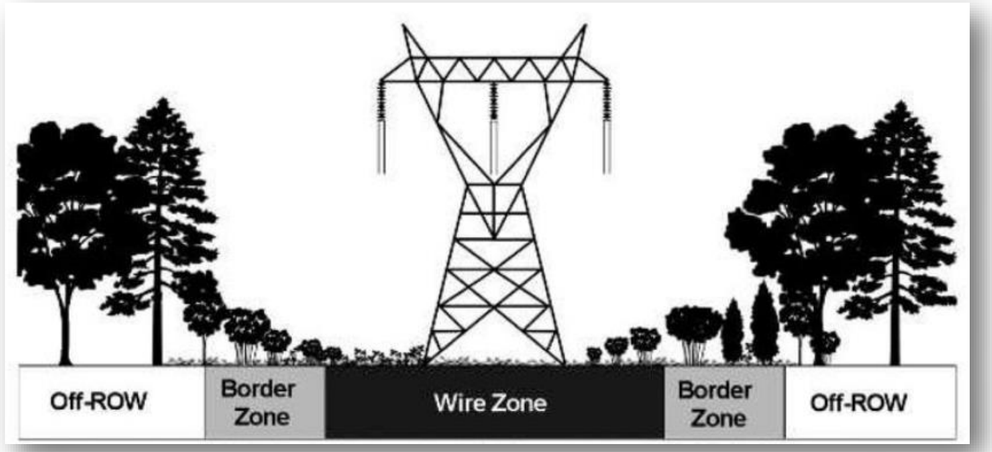


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Planning your ROW

Corridor Zone	Target Vegetation Height & Type	Wildfire Mitigation Function	Ecological & Habitat Value
Wire Zone / Pipe Zone	Low-growing native herbaceous cover	Eliminates vertical ladder fuels beneath conductors or over pipelines	Provides dense foraging and nesting cover for grassland birds and other wildlife
Border Zone	Low-maturing native shrubs, bushes, and tall herbs	Establishes a multi-tiered fuel break	Creates high-value soft-edge shrubland habitat
Outer Hazard Zone	Mature trees assessed for fall risk	Eliminates 'hazard trees' that could fall	Preserves contiguous canopy forest off-ROW while selectively removing snag hazards.



DOI: https://doi.org/10.48044/jauf.2007.051

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Vegetation Management and Reducing Fire Risks

- Invasive species control
- Manage fuel loads
- Time activities strategically
- Create fire-resistant landscapes
- Protect critical infrastructure
- Maintain emergency access

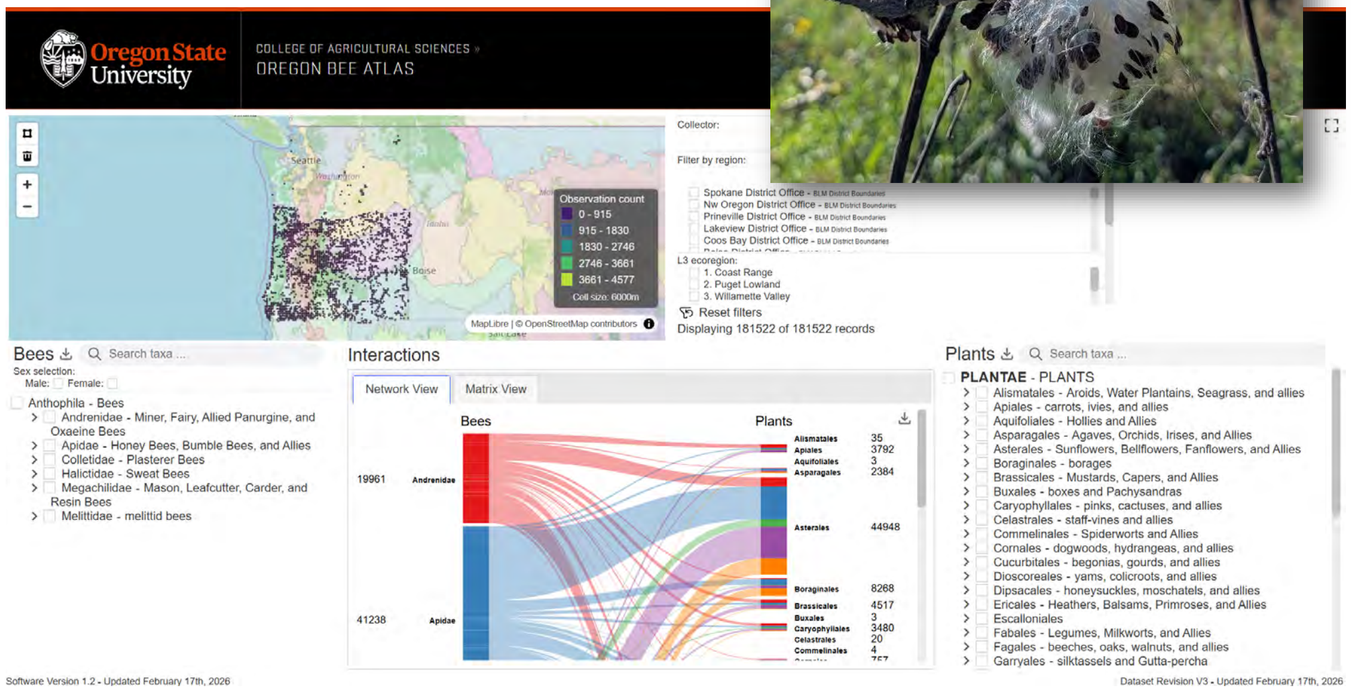
Category	Desirable Low-Risk Species	High-Risk / Volatile Species	Management Action
Grass & Herbaceous Layer (Wire/Pipe Zone)	Native perennial bunchgrasses, wildflowers	Invasive annual grasses	Promote native perennial herbaceous cover; execute spot herbicide control on invasive annuals before seed set.
Shrub Layer (Border Zone)	Low-maturing shrubs	Resinous, volatile shrubs	Selectively retain low-growing native shrubs; remove high-resin volatile brush patches near critical structures.
Tree Canopy Layer (Off-ROW Edge)	Stable, deciduous hardwoods with high foliage moisture content	Fast-growing saplings	Eradicate tree saplings on ROW via IVM; remove dead/dying hazard snags off-ROW before fire season.

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Seed Mix Considerations

- Low ignition rate – low oils/terpene
- Low fuel load
- Native
  - Outcompete invasives, non-native, incompatibles
- Supports pollinators and other wildlife
- Fire-wise shrubs on boarder





https://oregon-bee-project.github.io/melittoflora/viz.html

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Prescribed Fire

- Consumes fine fuels, leaf litter, and downed woody debris
- Suppresses woody brush encroachment and invasive weed seedbanks
- Stimulates fire-adapted native warm-season grasses and wildflowers
- Extends treatment rotation cycles and lowers long-term mechanical mowing expenses



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Partnership Opportunities

- Local Prescribed Burn Associations
- State forestry agencies
- Tribal practitioners
- Federal land management agencies
- Universities and extension offices
- Regional conservation groups

Educational Opportunities

- Proactive vegetation management is a mandatory safety requirement
- Invasive species management is key
- Adaptive management plans keeping maintenance flexible
- Conducting habitat monitoring and risk assessments

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Where does your organization fall when considering risks

Vulnerable	Reactive	Compliant	Leading	Resilient
Nature risks are unrecognized or ignored. Actions occur only after incidents.	Responds after problems arise, focusing on avoiding repeat incidents. Limited to actions triggered by events, public pressure, or scrutiny.	Focused on existing regulations and requirements, not future risks. Nature actions are mainly to support permits, compliance, or partnerships.	Proactive focus on current and emerging nature risks and integrating them into operations. Targeted action to reduce risk exposure and to leverage opportunities.	Nature risk management is a core focus and “how we do business.” Action support resilience, redundancy, and outcomes that meet or exceed best practices.

Image: Condensed version of the Nature Risk Management Maturity Framework (Version 1.0). Source: https://rightofway.erc.uic.edu/wp-content/uploads/NatureRiskManagementMaturity-UIC_ERC-20250428.pdf

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Share your thoughts



https://forms.cloud.microsoft/r/gUCfBYmDWA

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Biodiversity + Nature in Energy and Transportation (BNEAT) Conference

Save the Date!
August 3-5, 2027, St. Louis, Missouri

Planned topic areas include:

- Connecting vegetation management, wildlife conservation
- Storytelling, reporting, and management crash courses
- Planning beyond the pendulum
- Flora, Fauna, and Fraud
- Creating your own Community Engagement – Corporate Nature Strategy – Wildlife Conservation – or Wildfire Risk Management – Plan

BNEAT

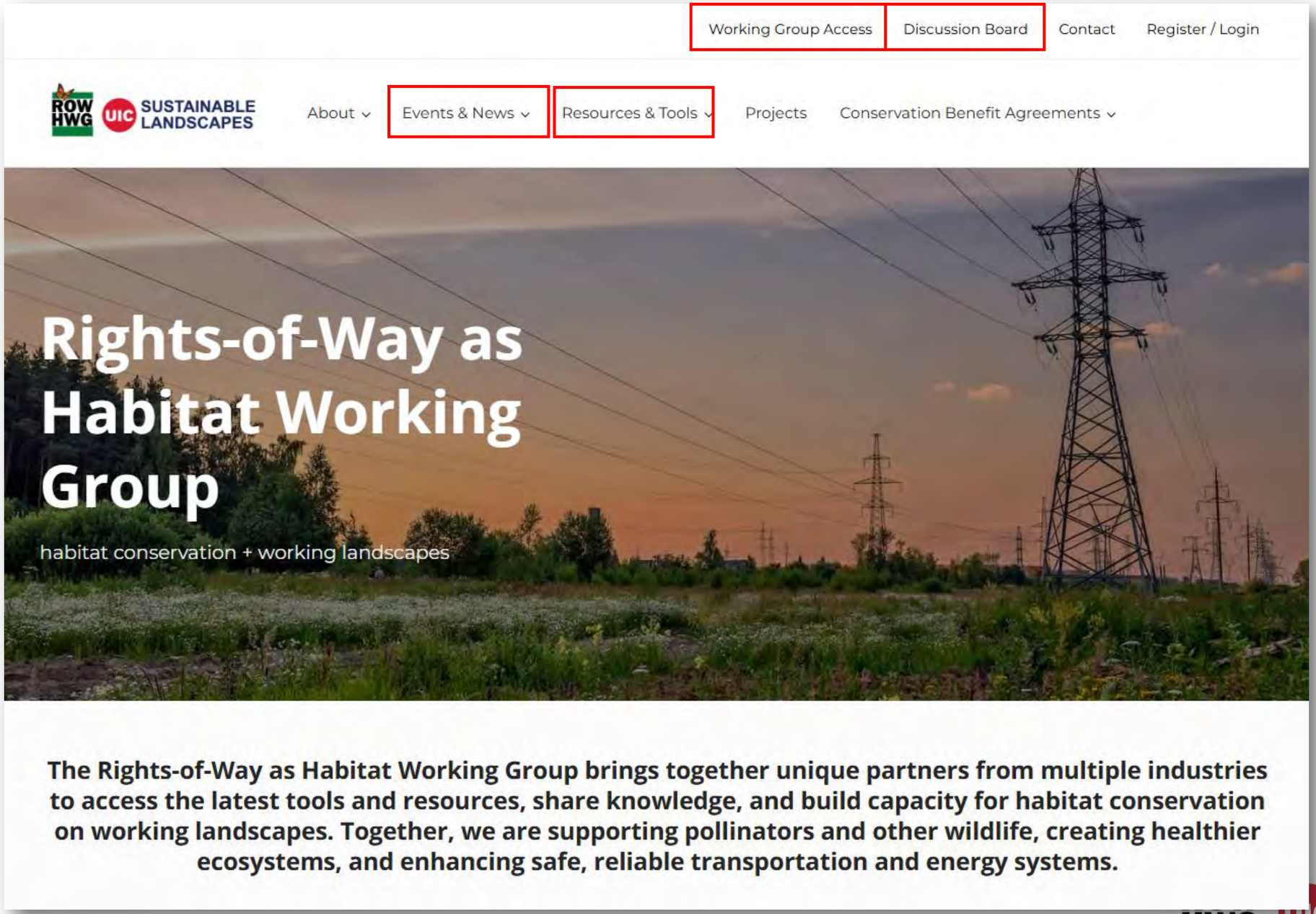
BIODIVERSITY + NATURE IN ENERGY AND TRANSPORTATION

Sponsorship opportunities are also available!

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Stay In Touch!

https://rightofway.erc.uic.edu/



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Connect with the Rights-of-Way as Habitat Working Group





Caroline Hernandez
cah272@uic.edu

Sustainable Landscapes Program,
Energy Resources Center,
University of Illinois Chicago
https://rightofway.erc.uic.edu/

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November 4th

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WELCOME & SAFETY MESSAGE

LOAD UP BUSES

8:30-8:45

Bus Assignments:

Groups 1 & 2 : First Bus; Group 3 & 4: Second Bus

FIELD TOUR 8:45-11:30
Camp Richardson 2001 Jameson Beach Road, South Lake Tahoe, California

Bus Assignments:

Groups 1 & 2 : First Bus; Group 3 & 4: Second Bus



KEYNOTE: KATHERINE BLUNT
AUTHOR, CALIFORNIA BURNING

GROUP TAKEAWAYS

Evolving Hazards: Understanding Emerging Safety Risks

Presenter: Bill Spencer | Eocene Environmental Group

- Workplace Safety & Violence
- Tree workers face 10× higher fatality risks than average U.S. workers.
- Leading hazards: struck-by incidents, falls, and electrocutions.
- New employees face greater injury risks; threats and violence against utility workers are increasing.
- Driving & Wildlife Hazards
  - Distracted driving and increasingly severe crashes threaten field crews.
  - Deer collisions are rising, with approximately 400 fatalities annually.
- Dog attacks and bite claims are increasing.
- Climate & Environmental Risks
- Extreme weather and unpredictable natural disasters create new safety challenges.
- Expanding tick populations, longer seasons, and emerging diseases increase exposure risks.
- Workforce Challenges
- Experienced workers are leaving faster than they can be replaced, creating critical knowledge and training gaps.

Key Takeaway: Safety programs must evolve to address changing environmental conditions, public interactions, and workforce challenges through proactive training and hazard awareness.

GROUP TAKEAWAYS

Leveraging AI as a Safety Tool

Morgan McKinney | Asplundh

- Moving from Reactive to Proactive Safety
- AI helps identify emerging risks, recognize trends, and prevent incidents before they occur.
- AI supports field experience and human decision-making rather than replacing them.
- Centralized Safety Portal
- Consolidates safety data, announcements, job behavior observations (JBOs), and training records.
- Interactive dashboards filter incidents, infractions, and trends by crew, location, and time.
- Tracks training compliance and identifies missing or expired certifications.
- Data-Driven Safety Management
- Weekly supervisor reports track crew observations, infractions, good catches, and near misses.
- AI identifies potential oversight gaps and supports crew accountability.
- Higher reporting rates may indicate stronger observation and reporting practices rather than poorer safety performance.
- AI-Powered Insights & Training
- Identifies emerging hazards and opportunities for targeted coaching.
- An internal AI chat assistant provides access to company safety standards, procedures, and best practices.
- Enables faster, better-informed safety decisions

Key Takeaway: The goal of AI isn't to collect more data—it's to use existing information more effectively to anticipate risks, strengthen accountability, and prevent accidents.

GROUP TAKEAWAYS

Asplundh | Bucket Truck Safety & Technology

Presenter: Kyle Allison, Asplundh Tree Expert

Fleet Operations: Asplundh operates approximately 10,000 bucket trucks, often completing 10+ setups per truck daily, making proper setup critical.

Rollover Prevention: Improper setup is a leading contributor to tip-over incidents. Stable ground, properly positioned outriggers, and adherence to manufacturer specifications are essential.

SlopeSense Technology: Monitors truck positioning and prevents aerial lift operation when the truck exceeds allowable slope limits (5° noted in the demonstration).

Built-In Safety Systems: Lanyard detection, collision sensors, audible alerts, warning strobes, and equipment interlocks help prevent unsafe operation.

Technology & Accountability: Samsara monitoring and dash cameras support fleet safety, while integrated sensors reduce reliance on operator judgment alone.

Key Takeaway

Safe Setup Is the First Line of Defense.

With thousands of trucks and repeated setups every day, even small mistakes can create significant risks. Combining proper training, manufacturer requirements, and technology that prevents unsafe operation helps protect crews before an incident occurs.

GROUP TAKEAWAYS

Aerial Rescue: Preparedness & Emergency Response

Ace Tree Enterprises | Hands-On Safety Demonstration

- Rescue Preparedness
- Aerial rescue training covered jobsite readiness, rescue procedures, and safe operations.
- Crews should have accessible rescue equipment, first aid supplies, and a clear emergency response plan.
- Regular hands-on practice helps crews respond confidently during emergencies.
- Emergency Response Procedures
    - Assess the scene and identify hazards before approaching.
    - Call 911, provide location and victim details, and notify supervisors.
    - Prepare rescue equipment, safely access and secure the injured climber, and assess their condition.
    - Lower the victim safely and transfer care to emergency responders.
- Live Rescue Demonstration
    - Demonstrated the rescue of a conscious climber unable to descend independently.
    - Emphasized communication, continuous hazard assessment, and proper rescue techniques.
    - Highlighted the importance of protecting rescuers and using appropriate PPE.

Key Takeaway: Effective aerial rescue begins long before an emergency. Proper preparation, practiced procedures, and situational awareness are essential to protecting both the injured worker and the rescue team.

Remember: The first rule of rescue is to avoid becoming a second victim.

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November 5th

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WELCOME & SAFETY MESSAGE

Safety Technology Panel: Emerging Technologies and The Impact on Safety

HOLLIS (LES) DAY, MOUNTAIN F. ENTERPRISE

LIZ FULTON, ASPLUNDH

GRACE ZARZECKI, LIVEO

JEN WHITACRE, NV5 – MODERATOR

Safety Technology Panel:
Emerging Technologies and The Impact on Safety

Panel Summary

- This panel explored how emerging technologies such as drones, LiDAR, artificial intelligence, and remote sensing are transforming safety in utility vegetation management. The discussion focused on how these tools help organizations identify hazards, improve decision-making, and reduce worker exposure to dangerous conditions.
- A central theme was that technology is not replacing the workforce; it is providing workers with better information and tools to perform their jobs more safely and effectively. While advancements in technology can improve hazard identification, planning, and operational efficiency, skilled professionals remain essential to interpreting information, making decisions, and performing the actual fieldwork.
- The conversation reinforced the importance of balancing technological innovation with human experience, training, and judgment.

Key Takeaway: Technology doesn't replace the workforce, it empowers workers to make safer, smarter decisions.
By combining emerging technologies with human expertise, the UVM industry can identify hazards earlier, reduce exposure, and improve safety without losing the essential role of skilled field professionals.

Intersection of Wildfire Plans & Vegetation Management Panel

Panelist:

Scott Witt, Liberty Utilities - Scott.Witt@libertyutilities.com

Joe Tuvell, NV Energy - Joseph.Tuvell@nvenergy.com

Darrell Daniel, SMUD - darrell.daniel@smud.org

Scott Witt

Liberty Utilities

Scott.Witt@libertyutilities.com



Intersection of Wildfire Plans & Veg Management

05 November 2026

Liberty®


Portola
Loyalton
NEVADA
CALIFORNIA
Lake Tahoe
Floriston
Truckee
Kings Beach
Reno
Liberty Turquoise Solar Facility
Tahoe City
South Lake Tahoe
Liberty Luning Solar Facility
Topaz Lake
Markleeville
Coleville/Walker

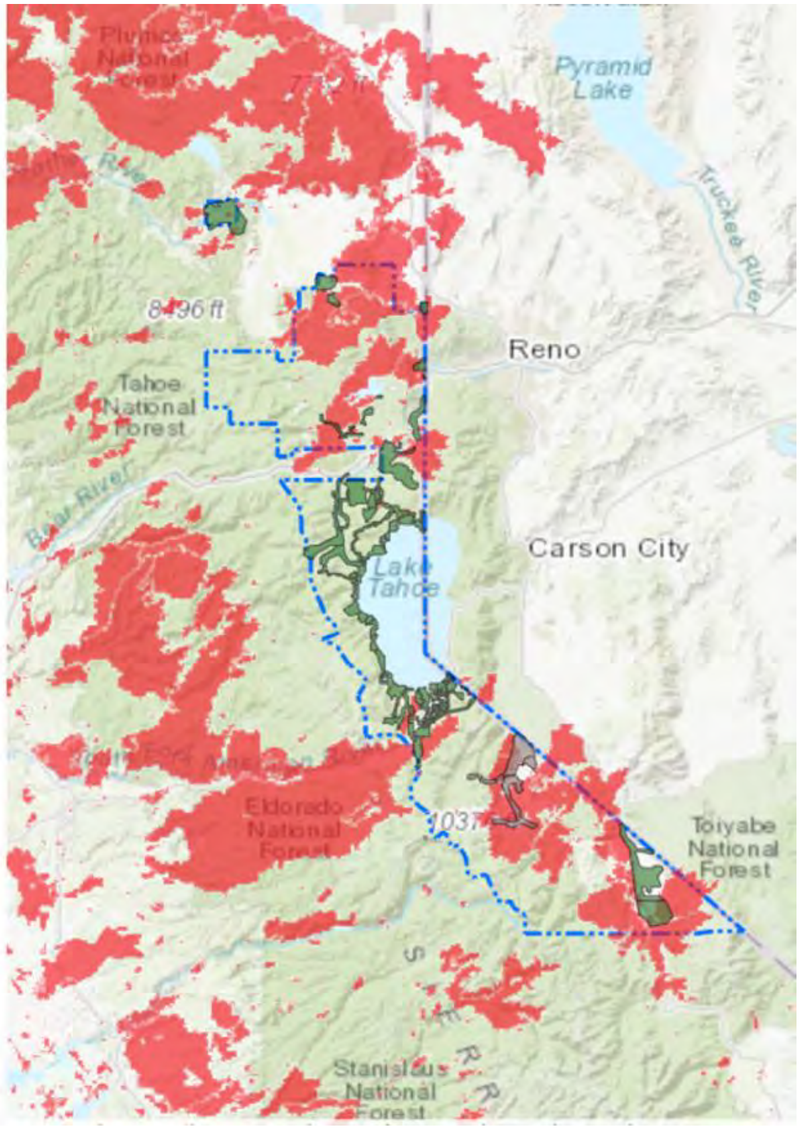
Fire History (1950 to Present)

Legend

California Historical Fire Perimeters

California Fire Perimeters (1950+)

Service Territory



Federal Wildfire Prevention Plans



National Fire Plan (2001)

Communities-at-Risk (CAR)

Self identified communities

1300+ California CARs

Healthy Forests Restoration Act (HFRA, 2003)

Community Wildfire Protection Plans (CWPPs)

(1) CAL FIRE, (2)Local FD, & (3) Local gov’t

Collaboratively developed by local, state, federal, tribal, & other partners

Nat’l Prevention Designations

Firewise USA® (NFPA)

- Voluntary national recognition program
- Neighborhoods or HOAs (8-2500 homes)

Fire Safe Councils (FSCs)

- Grassroots, typically nonprofit org

Wildfire Prepared Home / Neighborhood (IBHS)

- Insurance Institute for Business & Home Safety
- High bar for designation

Fire Adapted Communities (FAC)

- Broader; holistic (not formal)
- Predominately CA, but growing

CA Wildfire Prevention Plans

CA Strategic Fire Plan

Multi-year policy framework

CAL FIRE Unit Fire Plans

Refreshed annually

Wildfire & Forest Resilience Task Force Action Plan

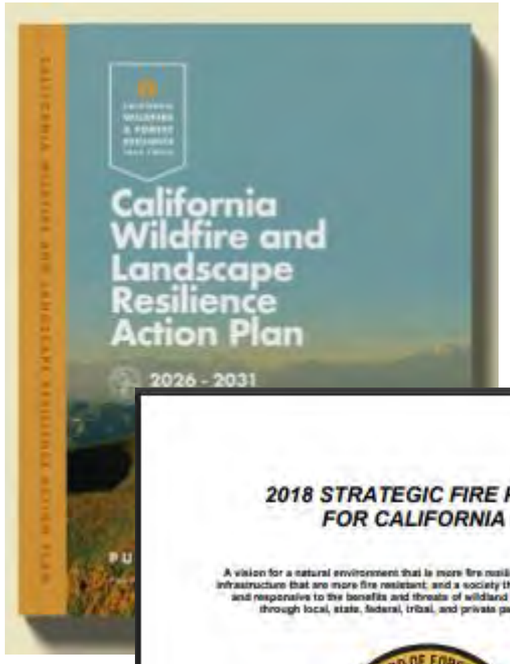
Interagency statewide strategy

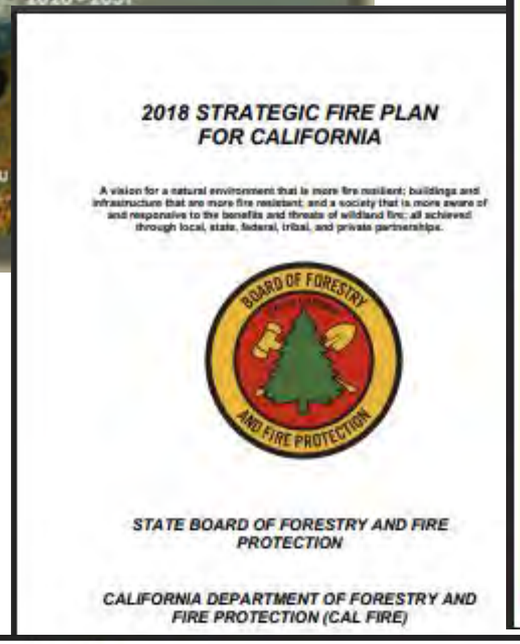
Fed, State, Local, Tribal

Good planning looks back in time

Analyzes the current situation

Proposes future efforts







WILDFIRE PREPARED®
A PROGRAM OF IBHS

CALIFORNIA FireSafe COUNCIL







NFPA®
FIREWISE USA®
RESIDENTS REDUCING WILDFIRE RISKS

Fuel Treatment Mapping

Wildfire & Forest Resilience Task Force Tracker

Interagency Tracker

CAL FIRE CalMAPPER

Generally department funded activities

Fuel Treatment Effectivness Re

“Success stories”



The goal?

<u>Reduce losses from wildfire</u>

- Lives
- Property
- Environment

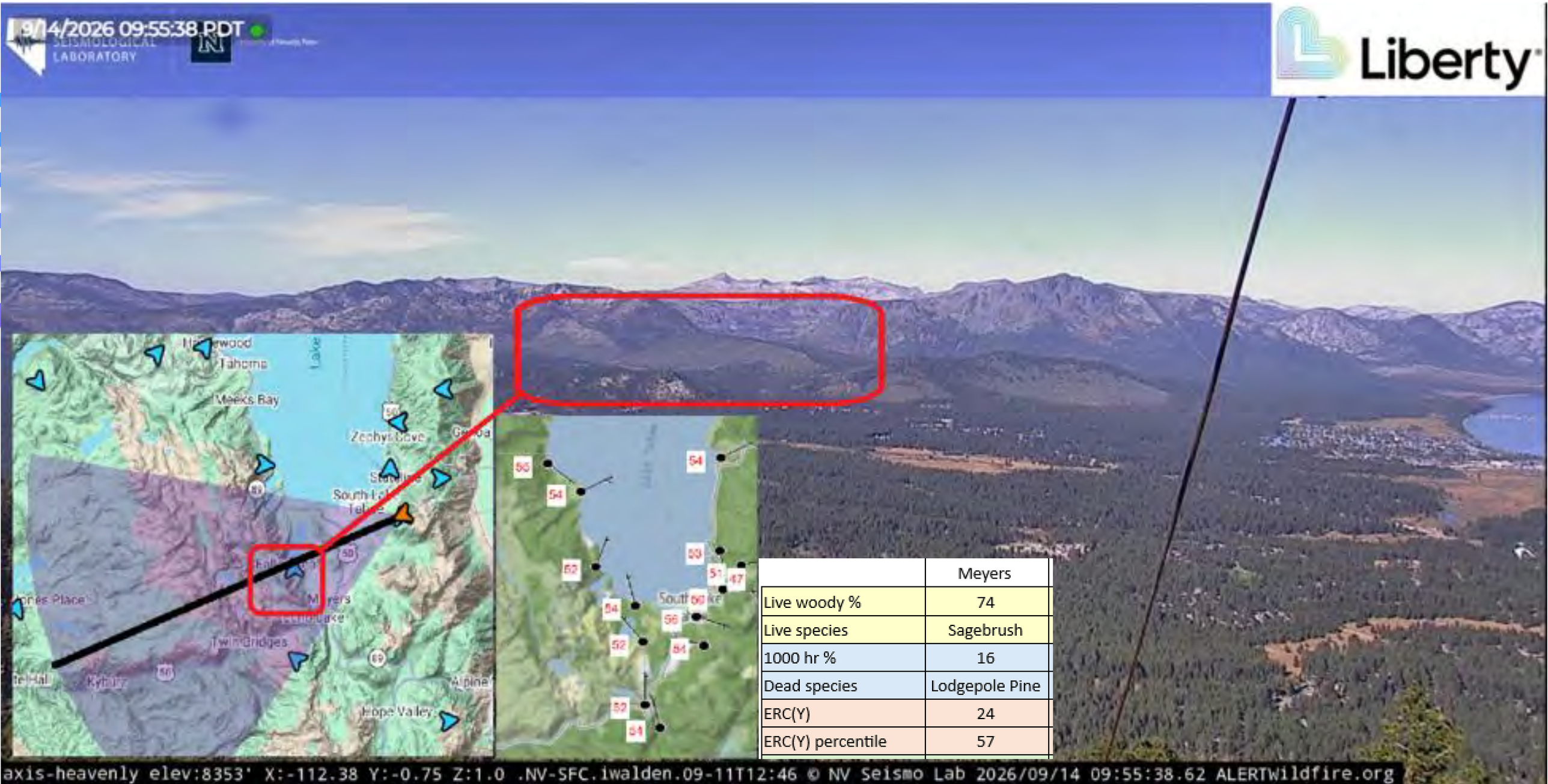
<u>Eliminate redundancy and waste</u>

<u>Improve efficinencies with collaboration</u>

One example:

All the local fire & fuels agencies met today (weekly) at Raley’s / coffee

Collaboration is vital!



	Meyers
Live woody %	74
Live species	Sagebrush
1000 hr %	16
Dead species	Lodgepole Pine
ERC(Y)	24
ERC(Y) percentile	57

Thank you

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Joe Tuvell

NV Energy

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CAT















Darrell Daniel

SMUD

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Goals:

- Reduce Risk
- Improve Safety
- Bolster Reliability/Resilience
- Improve Watershed/Forest Health
- UARP CE Shaded Fuel Break (2019-2024)

SMUD®



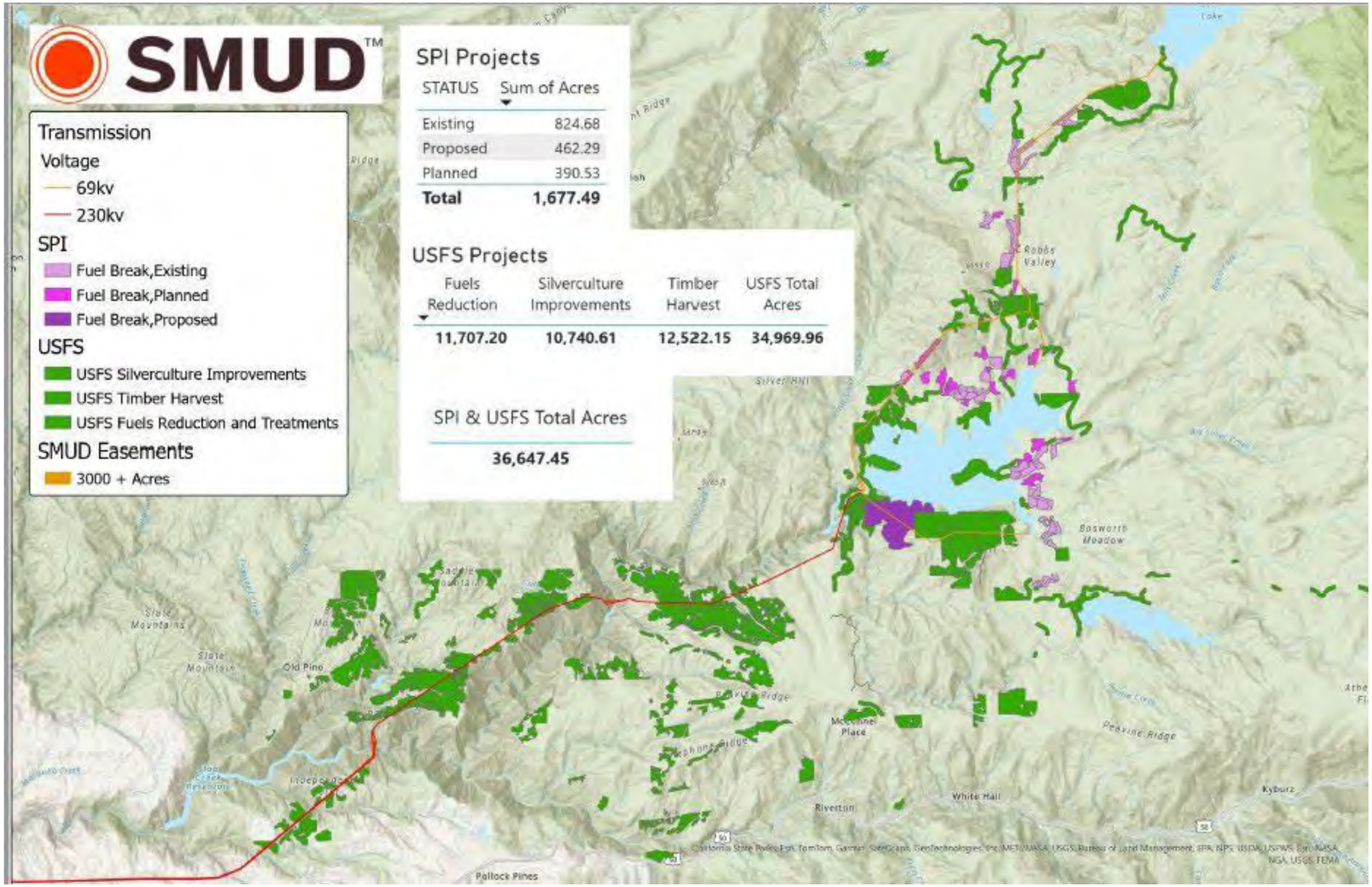








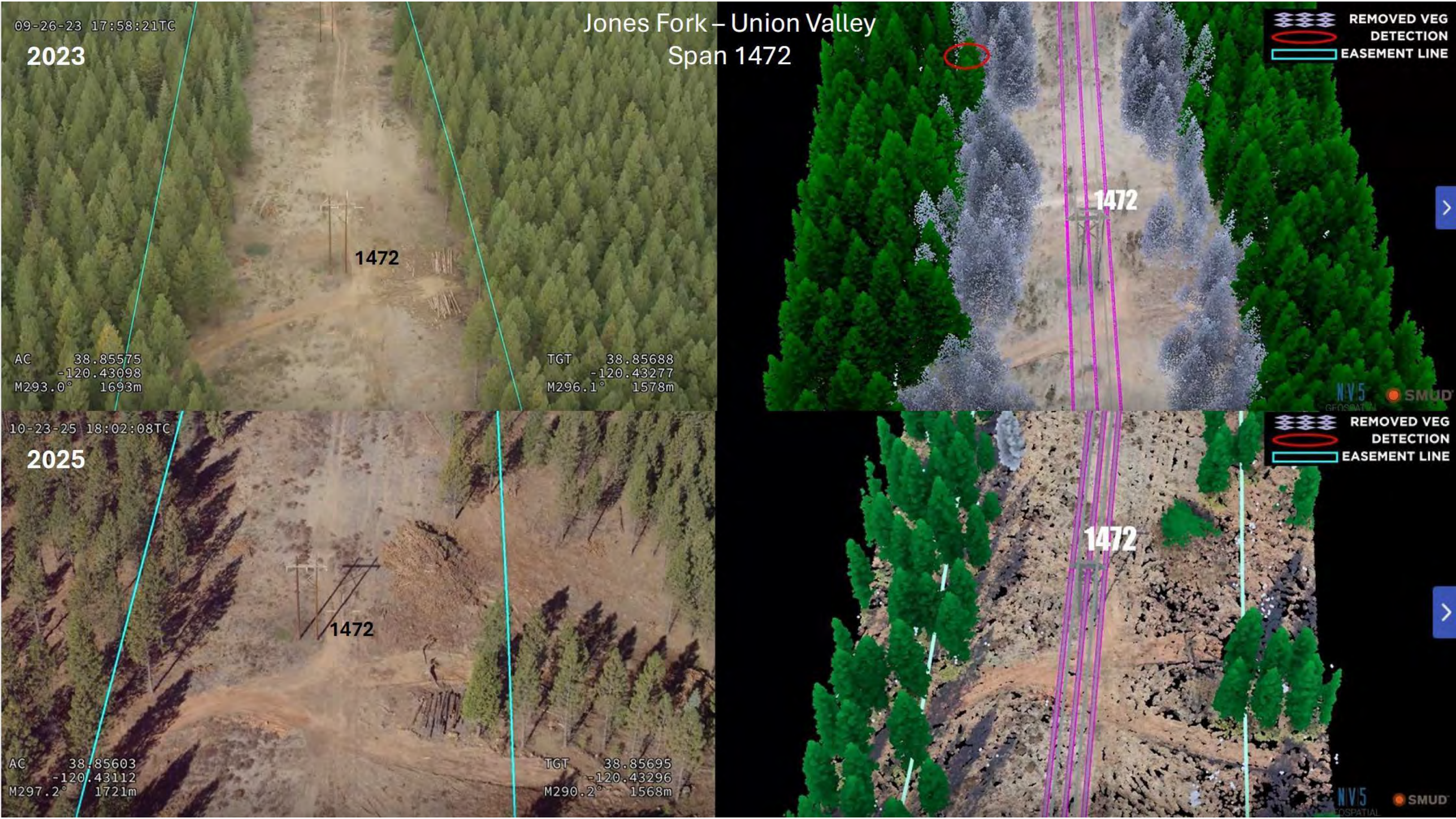
Leveraged Partnerships/Collaborations


SMUD™
Transmission
Voltage
69kv
230kv
SPI
Fuel Break,Existing
Fuel Break,Planned
Fuel Break,Proposed
USFS
USFS Silverculture Improvements
USFS Timber Harvest
USFS Fuels Reduction and Treatments
SMUD Easements
3000 + Acres
SPI Projects
STATUS | Sum of Acres
Existing | 824.68
Proposed | 462.29
Planned | 390.53
Total | 1,677.49
USFS Projects
Fuels Reduction | Silverculture Improvements | Timber Harvest | USFS Total Acres
11,707.20 | 10,740.61 | 12,522.15 | 34,969.96
SPI & USFS Total Acres
36,647.45
Bosworth Meadow
Pollock Pines
Riverton
White Hall
Kyburz
Peavine Ridge
McConnel Place
Old Pino
Slate Mountain


CAT

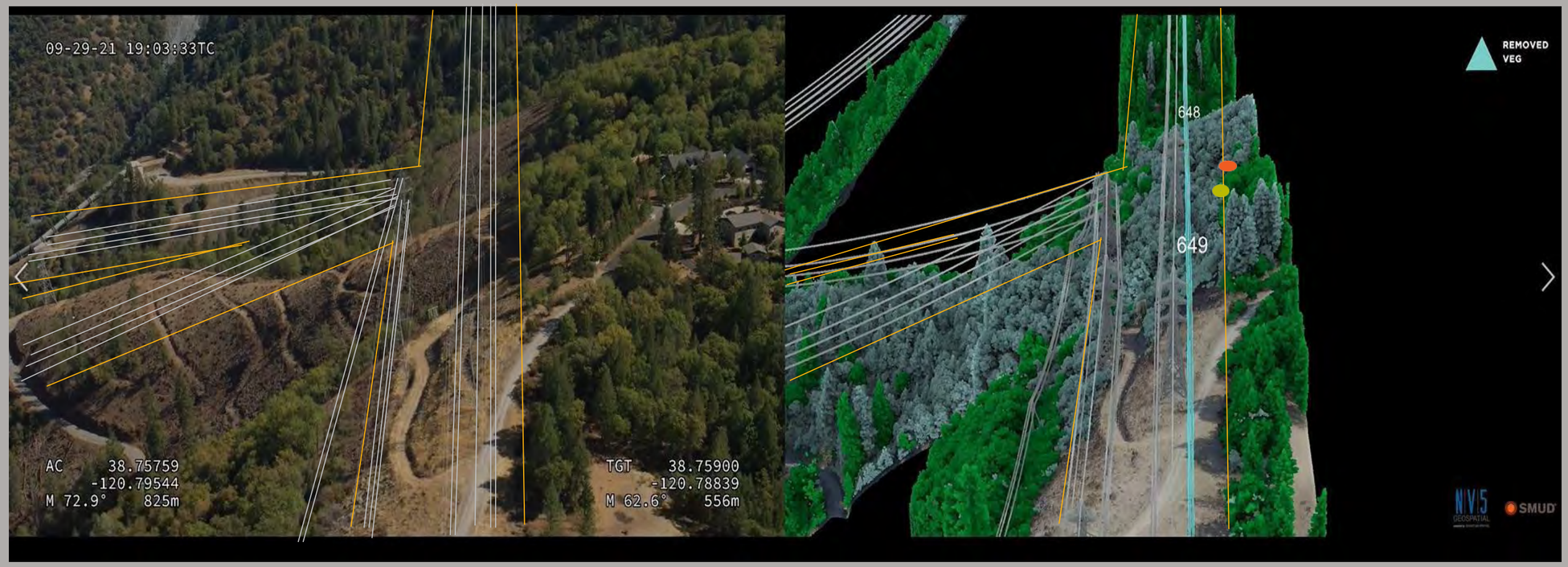





09-26-23 17:58:21TC
2023
Jones Fork – Union Valley
Span 1472
REMOVED VEG
DETECTION
EASEMENT LINE
1472
AC 38.85575
-120.43098
M293.0° 1693m
TGT 38.85688
-120.43277
M296.1° 1578m
10-23-25 18:02:08TC
2025
1472
AC 38.85603
-120.43112
M297.2° 1721m
TGT 38.85695
-120.43296
M290.2° 1568m
NV5
SMUD

Camino Lake

Change Detection



Approximate Easement line

Approximate wire locations

Camino Lake line

Grow ins

Critical Grow in

Blue Trees – Removed trees from 2019 data set

Green Trees – Existing trees in 2022 data set

SMUD







1 Year after entry- IVM at work, creating pollinator and low growing native early successional habitat (No seeding)

Union Valley 2023
Eldorado County

SMUD®

July 2023 SMUD Right-of-Way El Dorado County

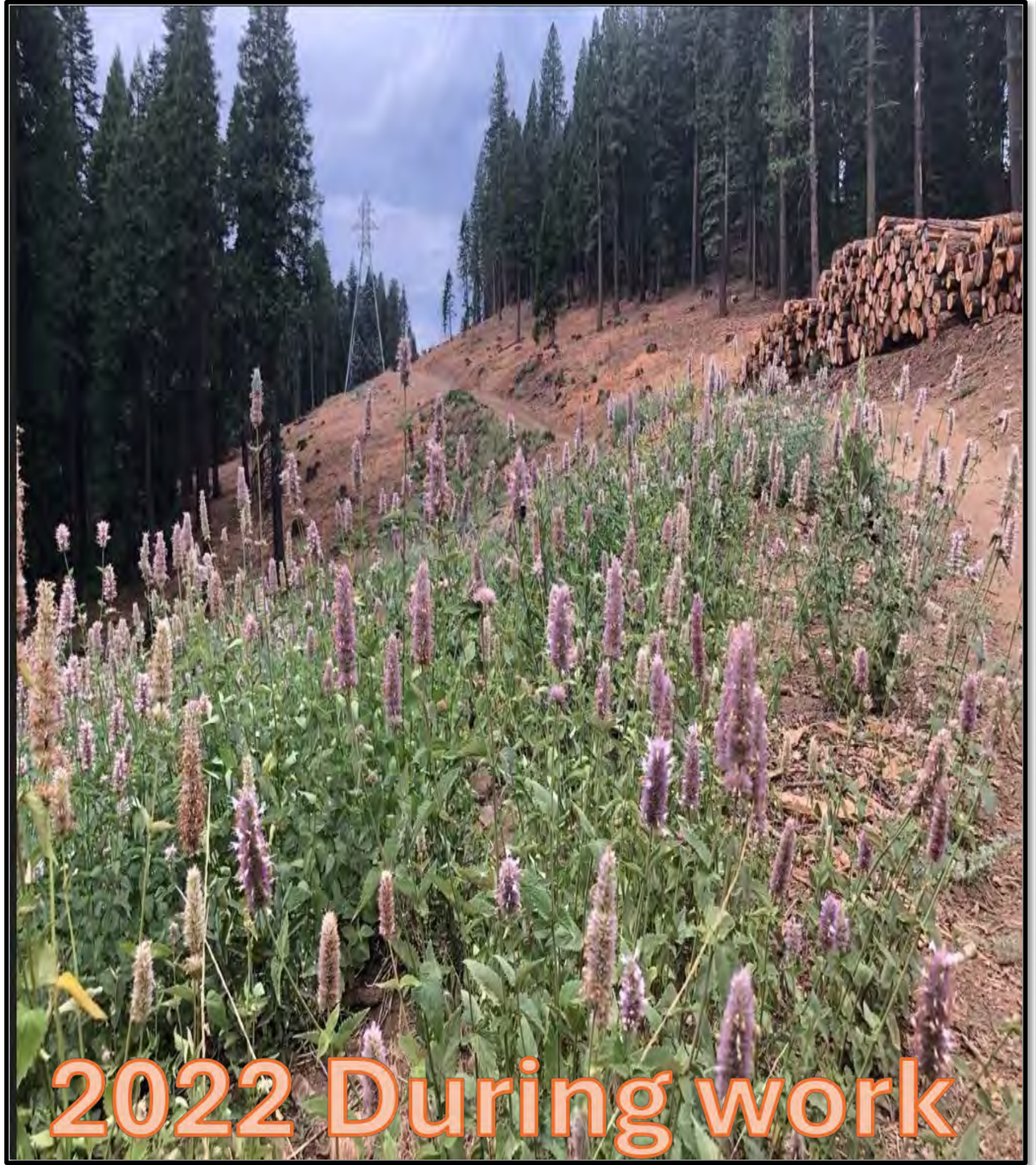
Results of 2022 Forest Health work

Utility (SMUD) & Federal Land Partner (El Dorado NF)








2022 During work


2025







Before

After





Before

After

Intersection of Wildfire Plans & Vegetation Management Panel

Panelists: Scott Witt (Liberty Utilities), Joe Tuvell (NV Energy), and Darrel Daniel (SMUD)

Panel Summary

This panel explored the critical relationship between wildfire mitigation planning and utility vegetation management, emphasizing the importance of collaboration, strategic planning, and technology in reducing wildfire risks.

The presentations highlighted how utilities can align vegetation management activities with federal, state, and local wildfire prevention efforts to improve efficiency, reduce overlapping work, and strengthen community resilience. Panelists also presented approaches to fuel treatment planning, vegetation monitoring, and the use of geospatial data to identify changing conditions and support proactive management decisions.

A central theme was that effective wildfire mitigation requires coordination beyond utility boundaries. By working together, utilities, fire agencies, government organizations, and local communities can better prioritize vegetation management efforts and reduce wildfire risks.

Key Takeaways

Effective wildfire mitigation doesn't stop at utility boundaries, it depends on collaboration, coordinated planning, and proactive vegetation management.

By aligning wildfire prevention strategies, sharing information, and leveraging technology, utilities and their partners can reduce risks, improve efficiency, and build more resilient communities



Z133 Presentation

Presented by:
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POWERING THE FUTURE









UAA Western Regional Meeting & Safety Summit

ANSI Z133 2026 Revision Changes

Presented By:

Morgan McKinney

Corporate EHS Manager

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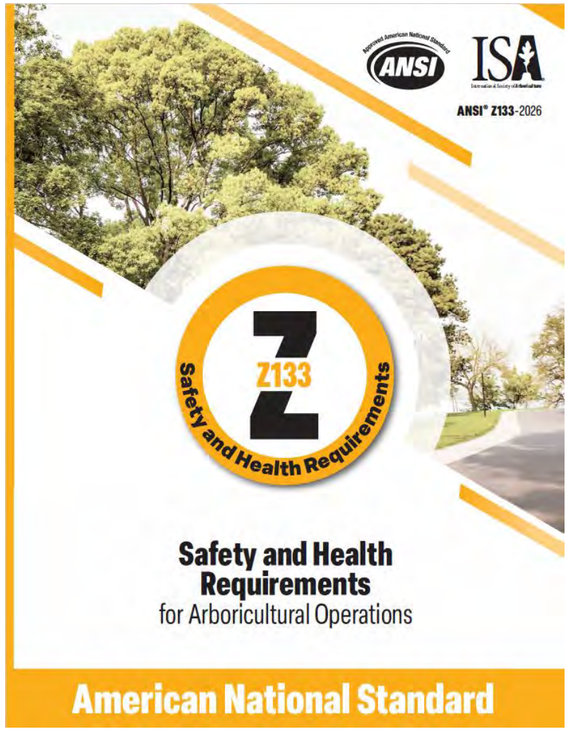
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ANSI Z133 2026 Revision Changes

The 2026 revision substantially reorganizes electrical hazard requirements, along with many other relevant changes and additions that impact utility arboriculture and line clearance.

Key Changes

- NEW Electrical Arborist Qualification Structure
- Insulating Pruning Tools
- Vegetation Contacting Conductors or Browned/Charred Vegetation
- Step and Touch Potential
- Additional Severe Weather Language (High Winds)
- NEW Training and Education Section



ANSI Z133 2026 Revision Changes

NEW Electrical Arborist Qualification Structure

- Level 1 Arborist: Unqualified for Any Voltages (4.2)
- Level 2 Arborist: Qualified for Voltages of 750 V or less (4.3)
- Level 3 Arborist: Qualified for Voltages Up to 35 kV (4.4)
- Level 4 Arborist (Line Clearance): Qualified for All Voltages (4.5)

Notes

- Replaces former Incidental Line Clearance classification
- Clearly distinguishes utility line clearance operations from commercial arboricultural work that is NOT working for the purpose of clearing space around electric supply lines.
- Provides revised MAD tables for each qualification tier

ANSI Z133 2026 Revision Changes

Level 1 Arborist: Unqualified for Any Voltages

(4.2.2)

The Electrical Level 1 Arborist or trainee has received fundamental education in electrical hazard safety awareness but does not have related on-the-job experience nor familiarity with the related electrical system equipment or with performing arboricultural operations in proximity to any voltages. They shall not perform work where electrical hazards exist.

ANSI Z133 2026 Revision Changes

Level 2 Arborist: Qualified for Voltages of 750 V or less

(Formerly Incidental Line Clearance)

(4.3.2)

The Electrical Level 2 Arborist is an arborist who performs arboricultural operations where an electrical hazard of low voltage (750 V or less) exists but who is not working for the purpose of clearing space around the electric supply lines on behalf of the utility or organization that controls or operates the lines or equipment. The Electrical Level 2 Arborist shall have related training and on-the-job experience, be familiar with the electrical system equipment, and have demonstrated the competency in performing arboricultural operations in proximity to voltages of 750 V or less.

ANSI Z133 2026 Revision Changes

Level 3 Arborist: Qualified for Voltages Up to 35 kV

(Formerly Incidental Line Clearance)

(4.4.2)

The Electrical Level 3 Arborist is an arborist who performs arboricultural operations where an electrical hazard of voltages (35 kV or less) exists but who is not working for the purpose of clearing space around the electric supply lines on behalf of the utility or organization that controls or operates the lines or equipment. The Electrical Level 3 Arborist shall have related training and on-the-job experience, be familiar with the electrical system equipment, and have demonstrated competency in performing arboricultural operations in proximity to voltages of 35 kV or less.

ANSI Z133 2026 Revision Changes

Level 4 Arborist (Line Clearance): Qualified for All Voltages

(4.5.2)

The Electrical Level 4 Arborist, also known as a line clearance arborist, is an arborist who performs line clearance arboricultural operations for the purpose of clearing space around the electric supply lines and equipment on behalf of the utility or organization that controls or operates the lines or equipment. The Electrical Level 4 Arborist shall have related training and on-the-job experience, be familiar with the electrical system equipment and hazards of performing arboricultural operations in proximity to all voltages, and have demonstrated the competency in performing arboricultural operations in proximity to all voltages.

ANSI Z133 2026 Revision Changes

Insulating Pruning Tools

The 2026 revision provides significantly more structure around the use, inspection, maintenance, and testing of insulated pruning tools. The standard more closely aligns with OSHA 1910.269 expectations regarding tools used within electrical hazard zones.

Notes

- Revised language stating “Shall be designed and constructed to withstand the line voltage” instead of stating “the minimum testing” (4.3.16, 4.4.16 & 4.5.16)
- No longer referred to as “Live Line Tools”, but now “Insulating Pruning Tools” (Annex I)
- Minimum Testing requirements remain the same from the previous revision (Annex I)
- More language to emphasize the use of insulating tools as part of a larger electrical control strategy, not as a substitute for MAD compliance.

ANSI Z133 2026 Revision Changes

Vegetation Contacting Conductors or Browned/Charred Vegetation

The 2026 revision provides more detailed direction for situations where vegetation is touching or is suspected of touching energized conductors.

Notes

- New Qualification Tiers & associated MAD charts will substantially impact when climbing should be avoided for Level 2 & Level 3 Arborists.
- Revised language that uses “Vegetation” instead of “Branches and other parts of trees” to provide more inclusive language (4.5.19 & 4.5.20)
- Inclusion of Level 4 Arborist (4.5.20.1 & 4.5.20.2)

ANSI Z133 2026 Revision Changes

Step and Touch Potential

The 2026 revision provides new operational requirements and stronger language

to avoid either step or touch potential for workers on the ground.

Notes

- If the distance between the aerial device and electric supply line(s) becomes closer than the required MAD, worker(s) shall warn the aerial lift operator and other personnel on the ground, if present, and direct them to keep clear of the vehicle and attached equipment (i.e. chipper) until MAD is visually established and communicated (4.1.11)

ANSI Z133 2026 Revision Changes

Additional Severe Weather Language (High Winds)

The 2026 revision provides more detailed language regarding what is considered High Winds, which provides specific guidance as to when arboricultural operations shall not be performed.

Notes

- Winds exceeding 40 mph, or 30 mph if material handling is involved (4.1.13 – Note)
- Vague language is provided as well that states “Unless the employer takes precautions to protect the employees from the hazardous effects of the wind” (4.1.13 – Note)

ANSI Z133 2026 Revision Changes

NEW Training and Education Section

The 2026 revision addition of the Training and Education section is one of the more significant structural changes because it elevates training and education as a concept that was previously scattered throughout the standard into a dedicated standalone requirement.

Notes

- The employer shall require the employee to demonstrate competency before performing any safety-sensitive task without direct supervision (3.7.1)
- Conditional re-training requirements (3.7.6) for reasons such as:
  - Employee has performed a safety-sensitive task incorrectly
  - New technology, new equipment, and/or changes in policies and procedures
  - Otherwise determined as needed by the employer



Thank You!

THANK YOU & SAFE TRAVELS!

