

Firesheds, Quantitative Risk, PODs, & Strategic Response

Comparison of Fire Analytics Tools

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23 September 2021



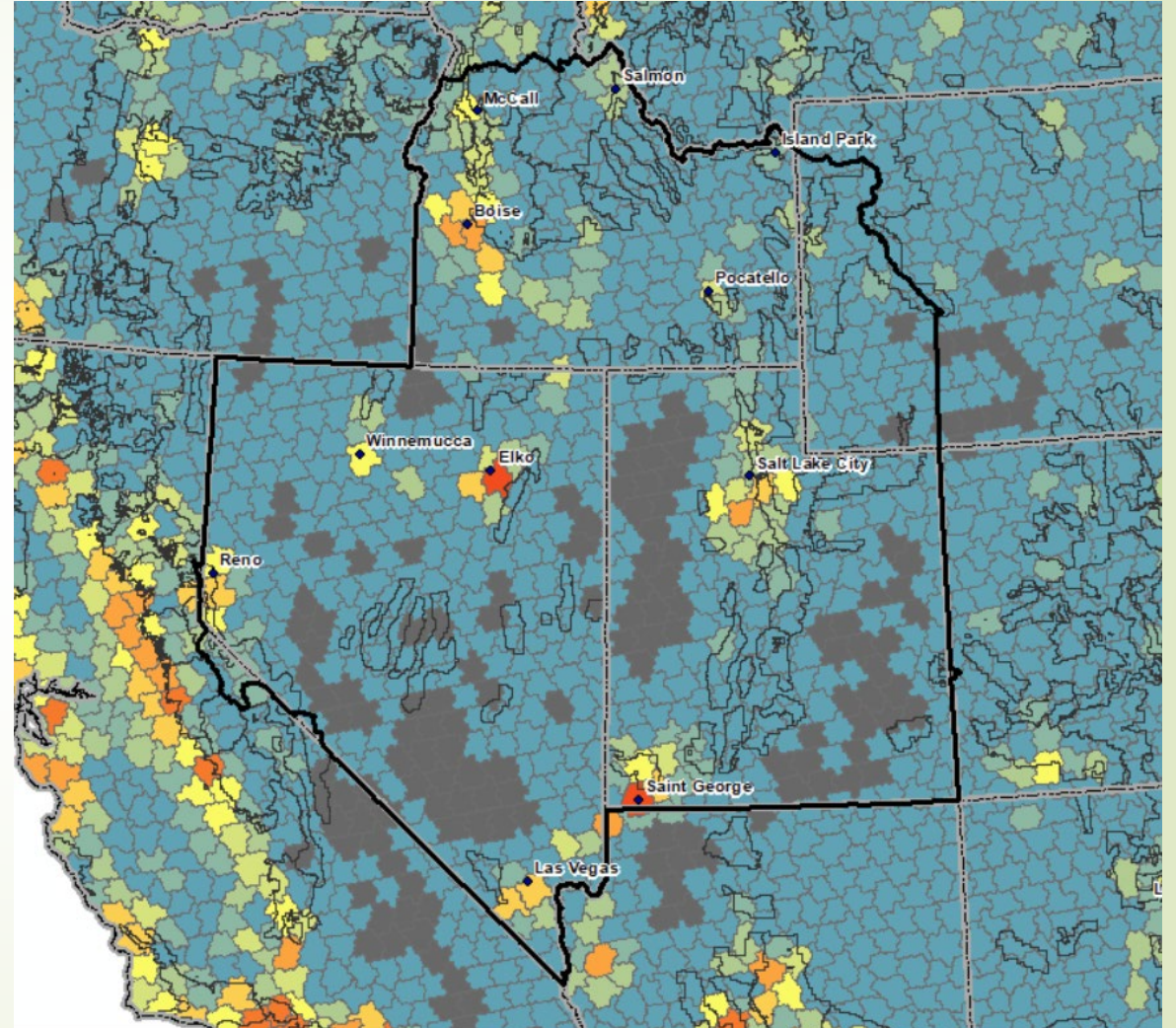
How do we use these products?

How do they relate to each other?

	Firesheds	QWRA	PODs	StratResponse
National Scale	YES	YES	n/a	n/a
Regional Scale	YES	YES	n/a	n/a
Forest Scale	NO	YES	YES	YES
Locally Editable	NO	YES	YES	YES
Risk	NO	YES	NO	YES
Likelihood	YES	YES	NO	YES
Intensity	NO	YES	NO	YES
Susceptibility/Importance	NO	YES	NO	YES
Considers WUI	YES	YES	YES	YES
Considers Non-WUI Values	NO	YES	YES	YES
Operational Tool	NO	YES	YES	YES
Fuels Planning Tool	NO	YES	NO	NO

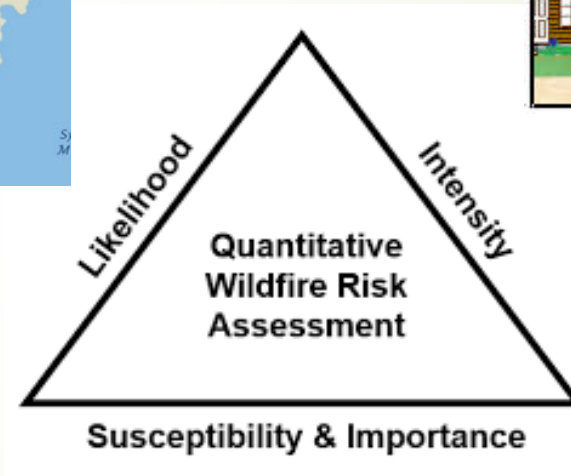
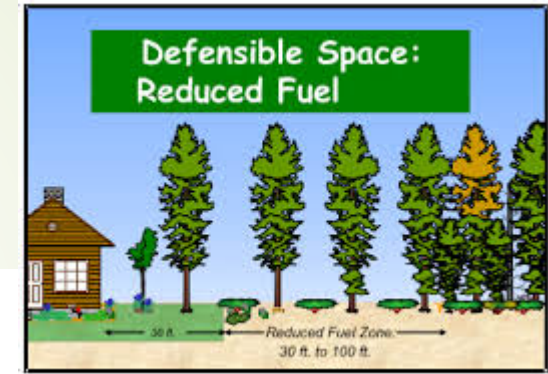
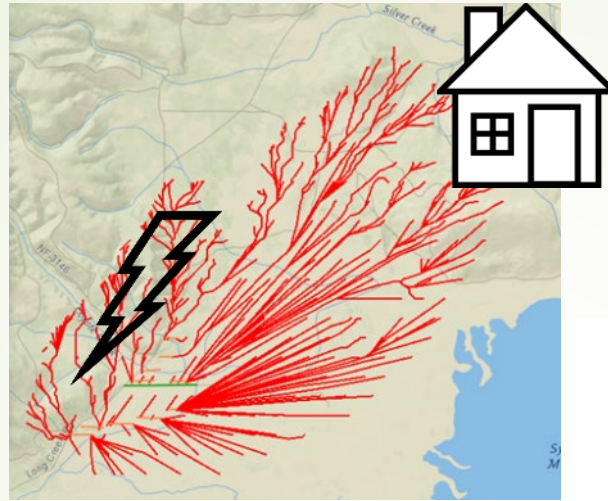
Firesheds

- Containers ~250K acres each.
- Red = SOURCE of wildfires that impact communities—*only communities*.
- High potential for national tracking of our success.
- Coarse scale



Grey means Fireshed is not a source of wildfires that impact communities.

There are many options to Reduce Risk



Academics disagree on which side of the triangle to focus to avoid loss to communities at risk.

Replace roof with fire-resistant material



Cover vents with metal mesh

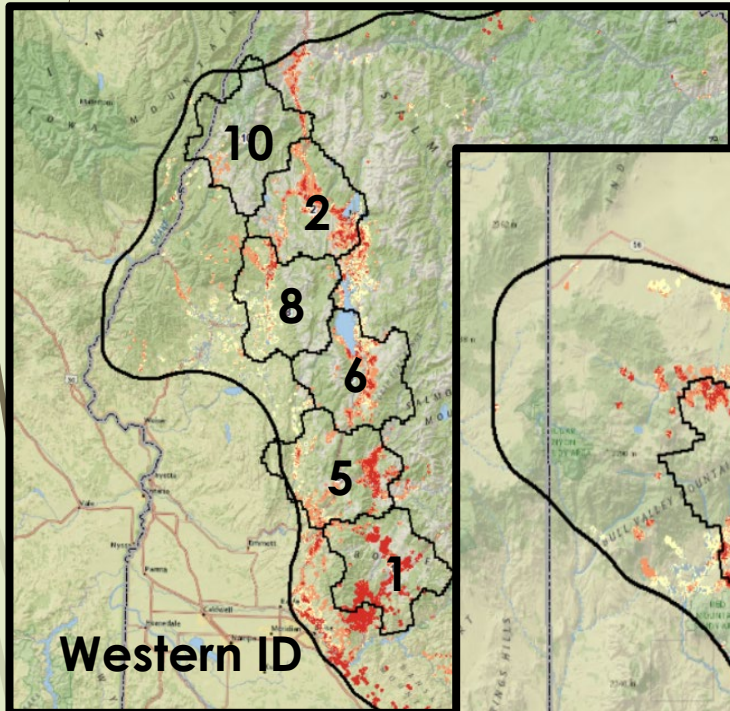


Keep gutters & decks clear

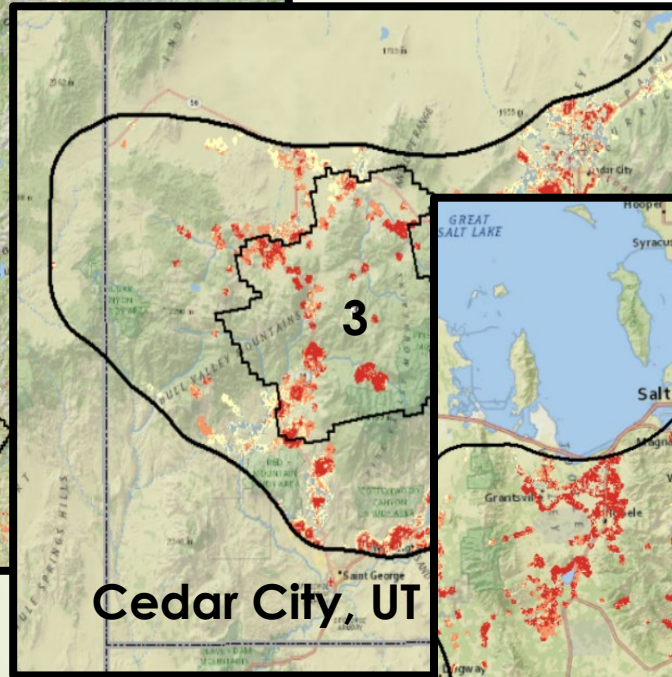


Top 10 USFS Firesheds

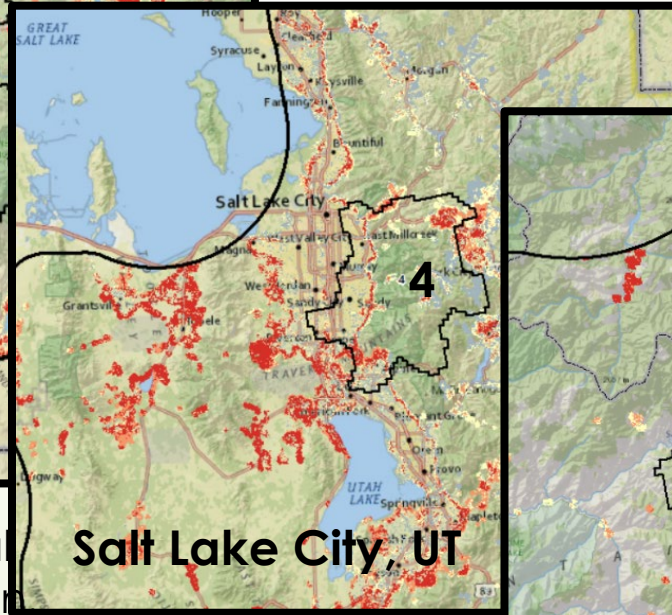
- Conifer Forest
- Treatable w/mechanical
- USFS Jurisdiction



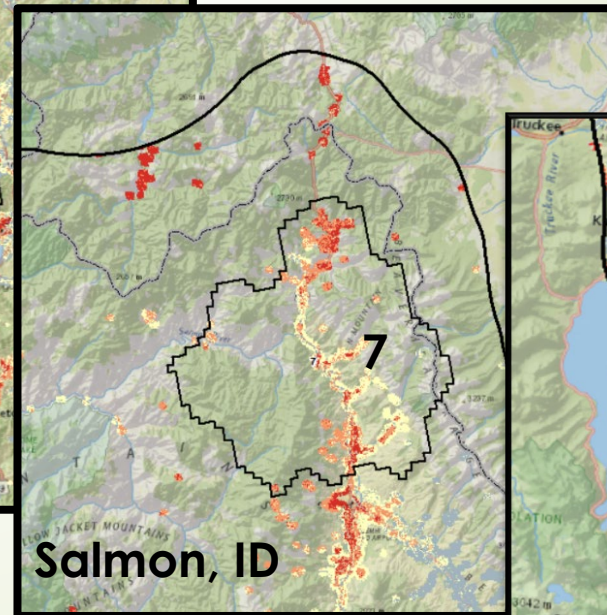
Western ID



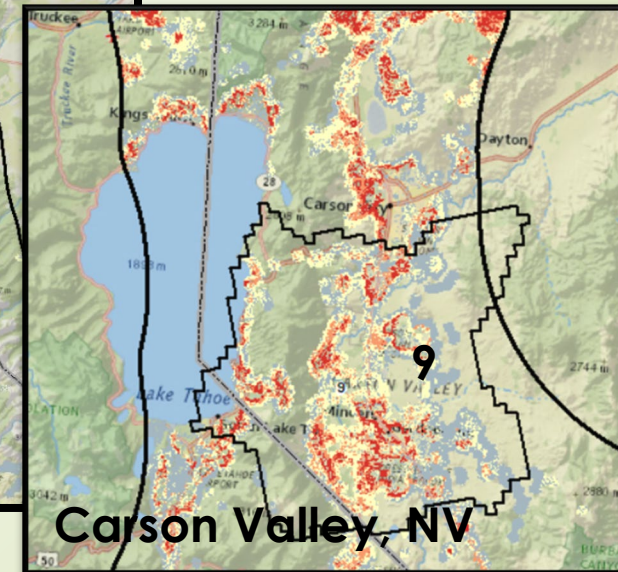
Cedar City, UT



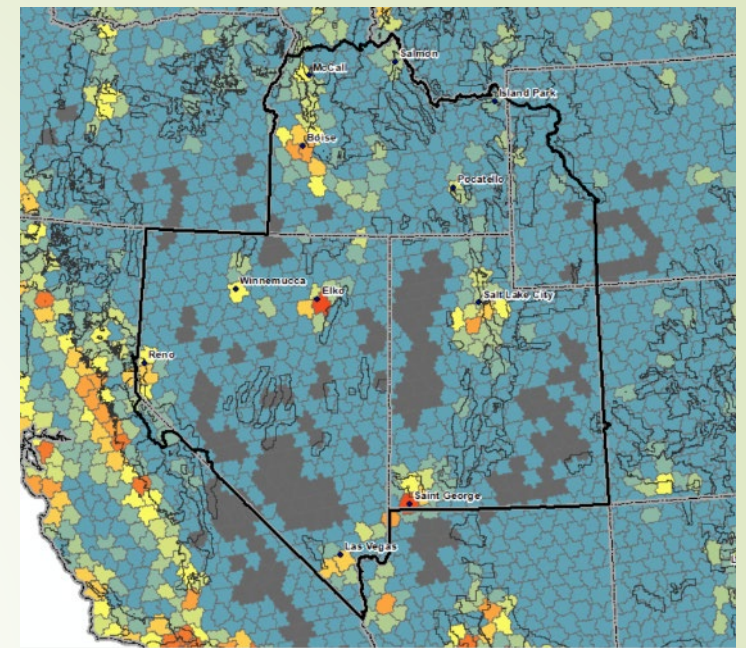
Salt Lake City, UT



Salmon, ID



Carson Valley, NV



Red pixels, here, show Regional QWRA loss to Human Habitation

**The commonly available Fireshed map shows Exposure independent of jurisdiction.*



For More Information About Firesheds

- ▶ Read more about the Fireshed Registry on RMRS site: <https://www.fs.usda.gov/rmrs/datasets/fireshed-registry-fireshed-and-project-area-boundaries-continental-united-states>
- ▶ 10-Year Scenario Investment Planning Platform (USFS): https://codyevers.com/usfs_sipp_10yr_plan/
- ▶ Get Fireshed Data here: <https://www.fs.usda.gov/rds/archive/catalog/RDS-2020-0054>
- ▶ GTR-425 (May 2021): https://www.fs.fed.us/rm/pubs_series/rmrs/gtr/rmrs_gtr425.pdf
- ▶ FEMA “Infogram” about Firesheds (July 2021): <https://www.usfa.fema.gov/blog/ig-070821.html>

Fireshed Registry

The **Fireshed Registry** is a geospatial dashboard built to organize information about wildfire transmission to communities and monitor progress towards risk reduction from management investments. The Registry is a unique approach to bring together a time window of information - past, present, and predicted future, to describe risk trajectories on lands where destructive wildfires are likely to originate. The dashboard provides an interactive system to view information on:

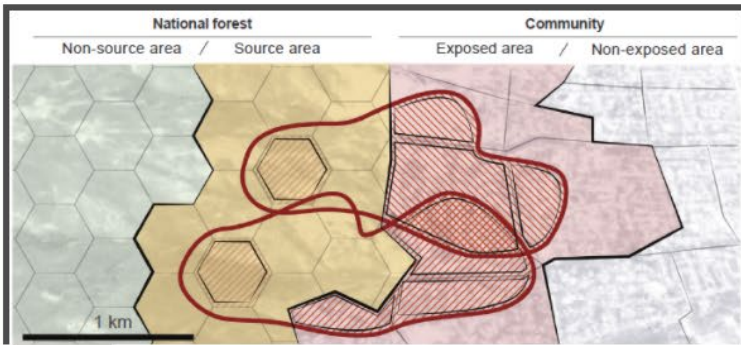
1. Context (Ownership, Fuels, and Buildings),
2. History (Fires and Treatments),
3. Projected wildfire risk (Simulated Fires),
4. Planned future treatments (5-year action plans), and
5. Prioritized treatment
6. Community zones and exposure

The proposed treatments are the results of one possible strategy, based on the scenario investment planning model. Panels with a yellow background have clickable records that will allow you to filter the features shown on the map.

To get started with this interface, **highlight the selection tool** in the top-left corner of this map, zoom in, and then click on your area of interest. If more than one "fireshed" is selected, please re-select just a single fireshed.

The **Fireshed Registry General Technical Report** provides more information on the development of Firesheds and the data shown here.

"Wildfire transmission to communities" occurs when fires start on public lands and grow into private lands where structures are exposed to wildfire risk.



Start Here Highlight the selection tool, zoom in, and pick a single fireshed to explore.

Showing 1

Firesheds: Nibley, Utah

- Area_HA 87,830
- Fireshed_ID 1,340
- Fireshed_Name Nibley, Utah
- Fireshed_Code nibley_ut
- Fireshed_State UT
- Number of 8
- Project Areas

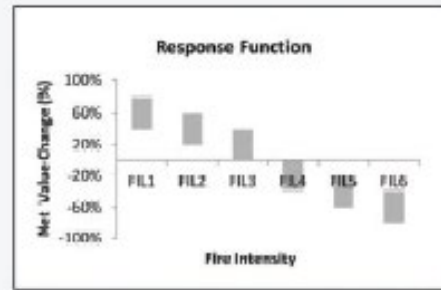
Use this map to set focus for all other maps, tables, and charts.

Quantitative Wildfire Risk Assessment (QWRA)

Methodology is detailed in GTR-315

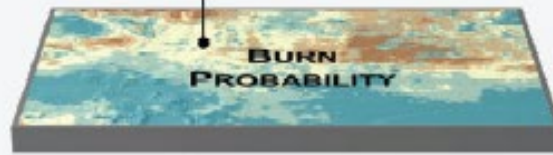
We decide Resources (natural) and Assets (human-made) to consider. We rank their importance.

- Critical Infrastructure
- Ecological Integrity
- Fish Habitat
- Heritage
- Human Habitation
- Recreation Infrastructure
- Suitable Timber
- Surface Drinking Water
- Wildlife Habitat



RESPONSE FUNCTION

WILDFIRE RISK



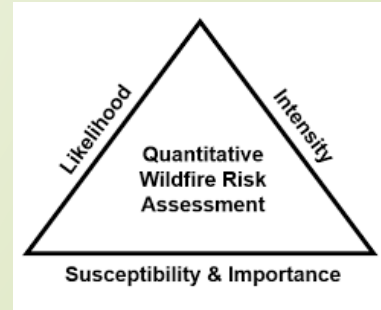
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WILDFIRE LIKELIHOOD AND INTENSITY

Fire modeling is done with FSIM simulation model to derive Annual Burn Probability & Flame Length.

We decide how HVRAs are affected by fire (based on fire effects science).



Quantitative Wildfire Risk Assessment (QWRA)

- ▶ Regional Risk Assessment (2019).
 - ▶ B-T has a forest-level risk assessment*.
- ▶ Customized to R4 HVRA, priorities, and fire effects.
- ▶ The output *integrates* risk for the things we care about—shows tradeoffs when there is overlap.
- ▶ QWRA also allows us to look at just *one* HVRA.
- ▶ Can inform Shared Stewardship, Timber, Watershed, Wildlife, Recreation, go/no-go use of wildfires, and hazardous fuels mitigation needs.



United States Department of Agriculture



Intermountain Region Quantitative Wildfire Risk Assessment

Methods and Results



Horse Thief Canyon Fire 2012

Photo: Andy Norman, USDA Forest Service

Prepared by:

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Julie W. Gilbertson-Day, Kevin C. Volger, April Brough, and Joe H. Scott – Pyrologix LCC

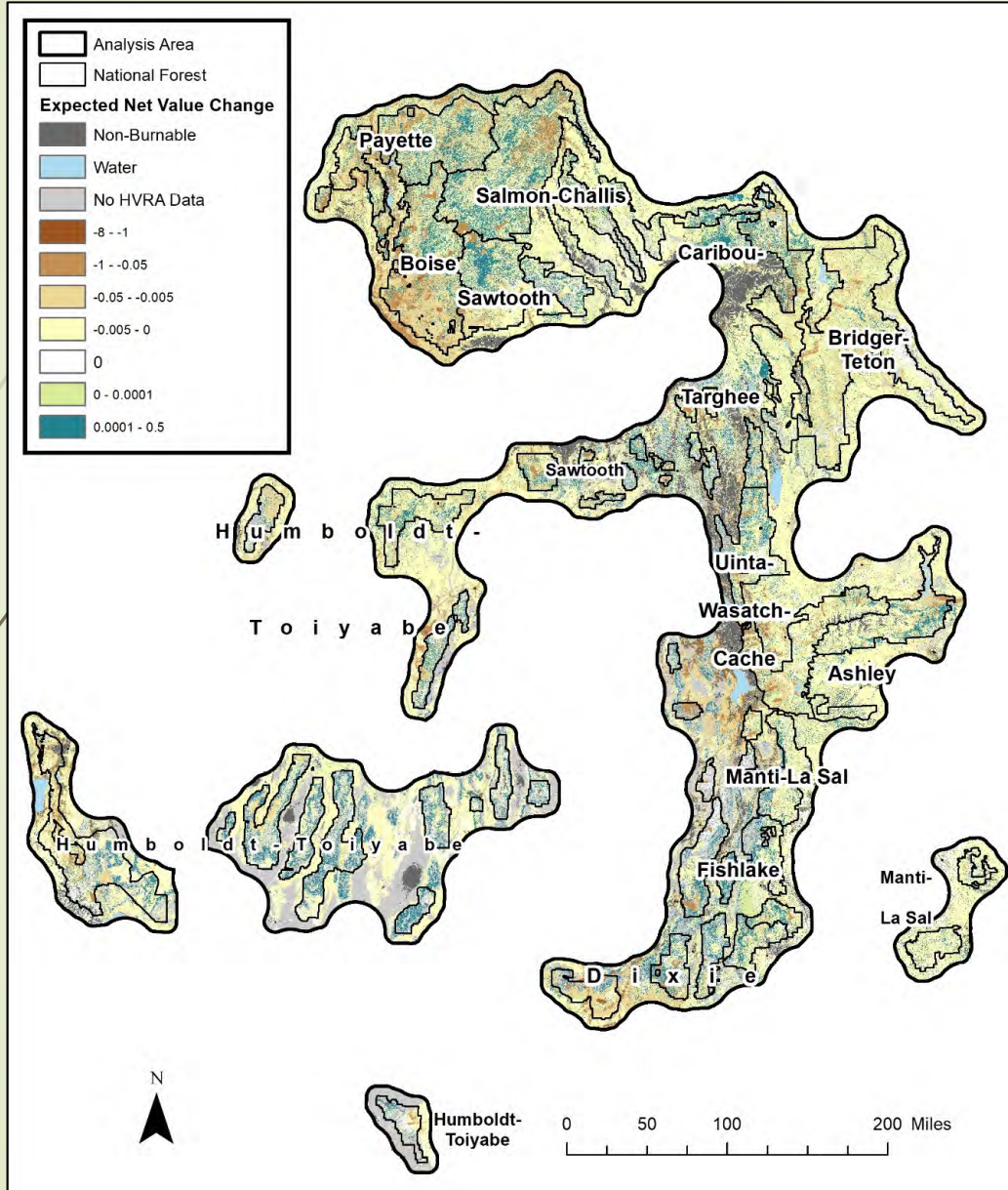
For:

Linda Chappell – USDA Forest Service Intermountain Region

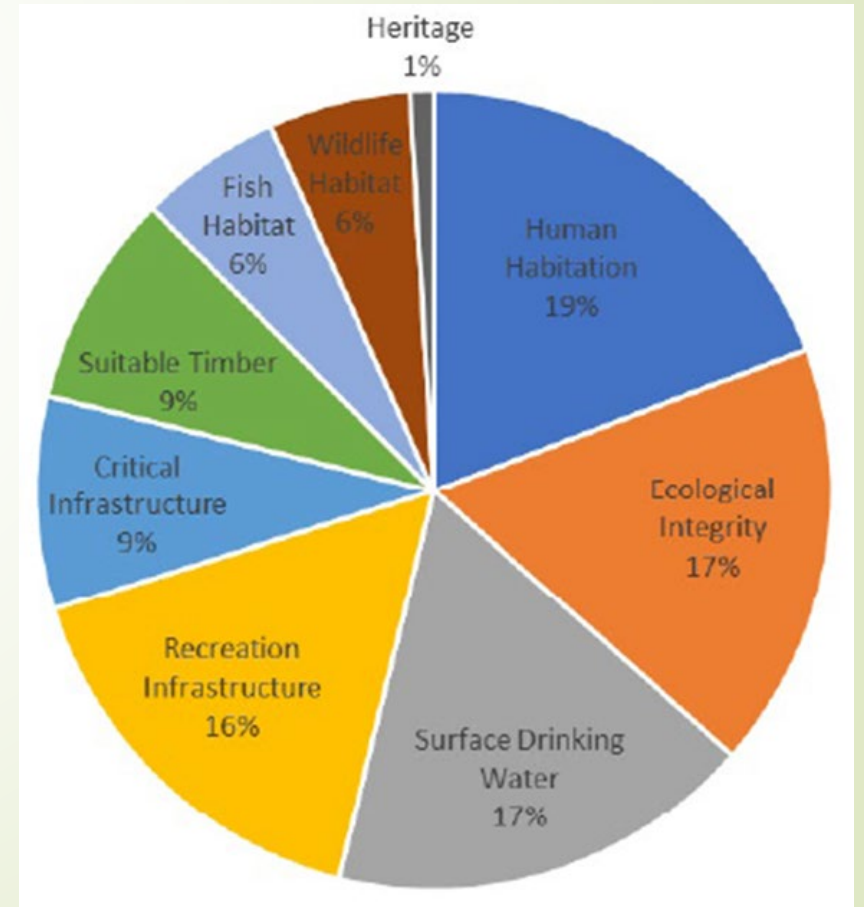
October 9, 2019

Fun Fact: The B-T is the featured example in GTR-315, considered the authoritative guide on completing QWRAs.

Quantitative Wildfire Risk Assessment (QWRA)

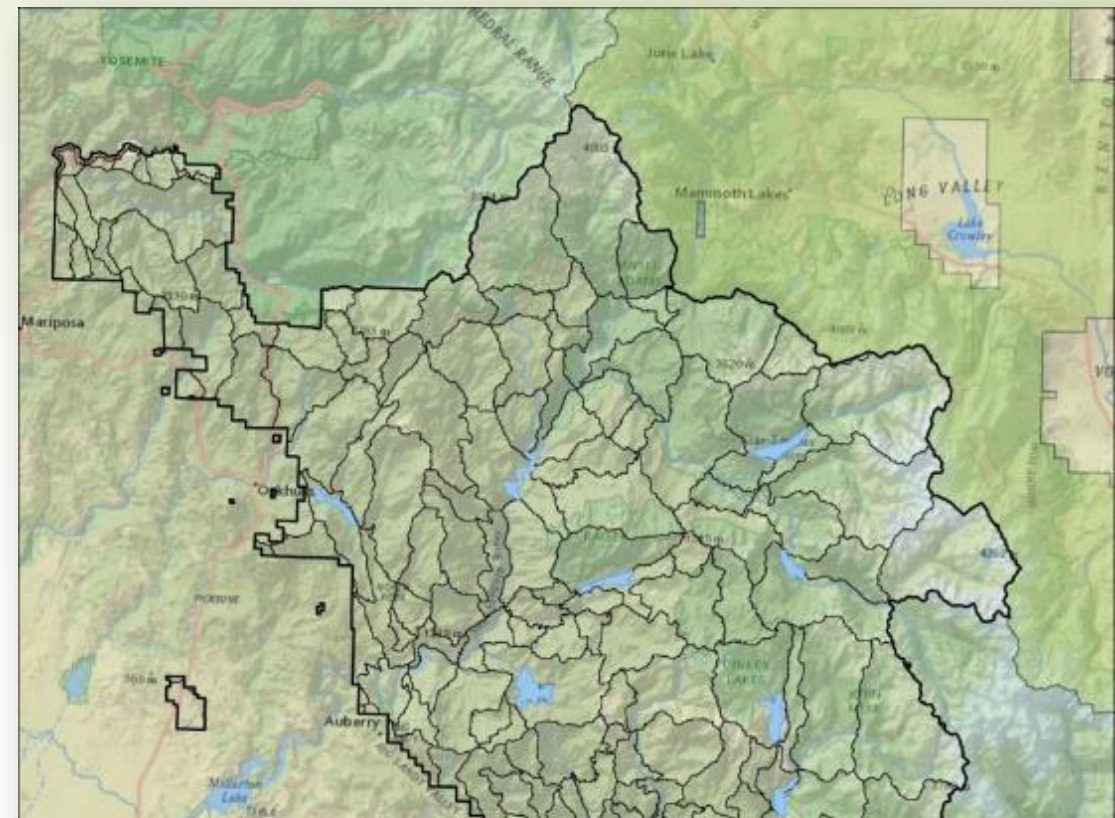


- Shows risk integrated across all HVRAs or to individual HVRAs.
- Identifies expected wildfire losses and benefits.



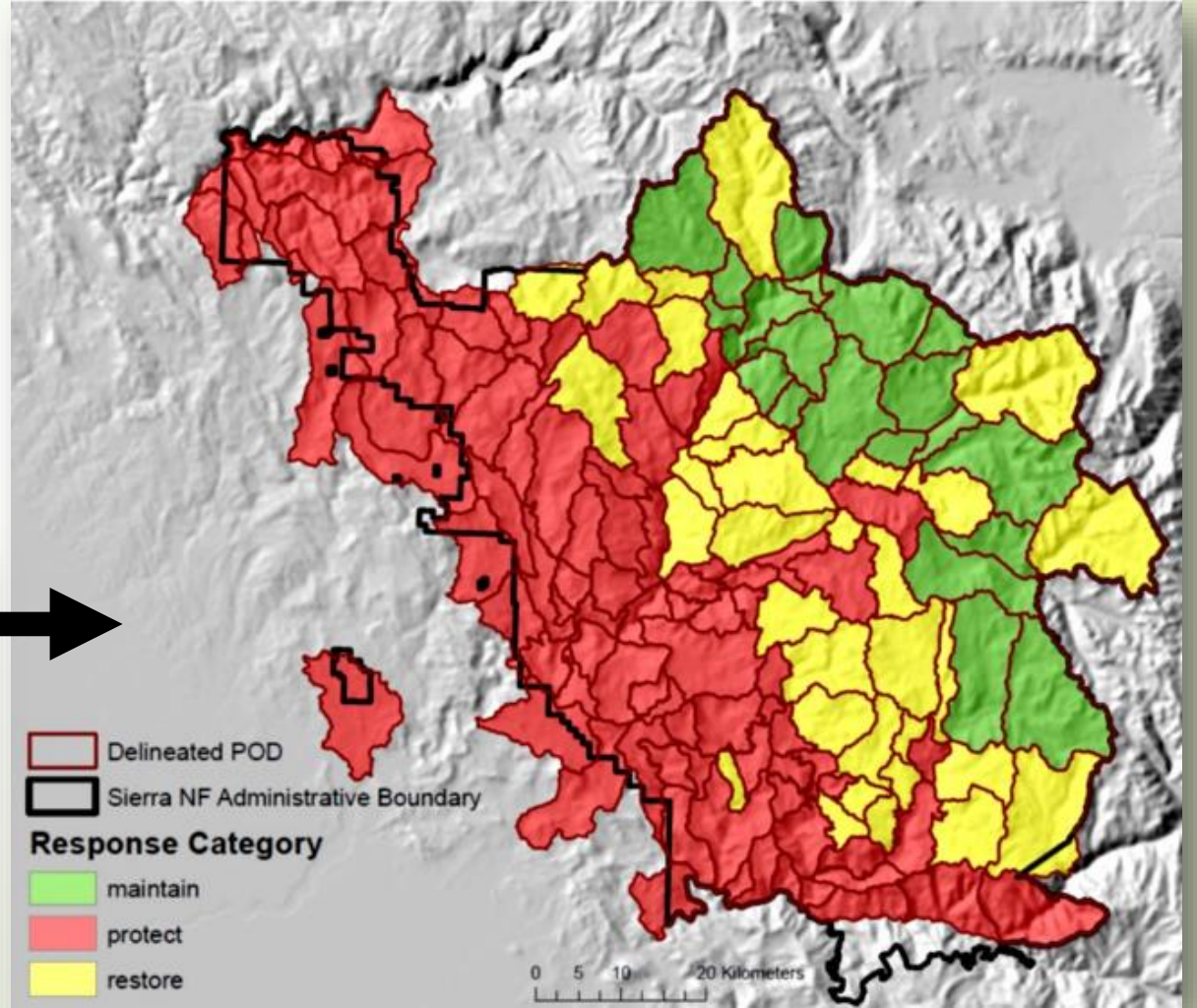
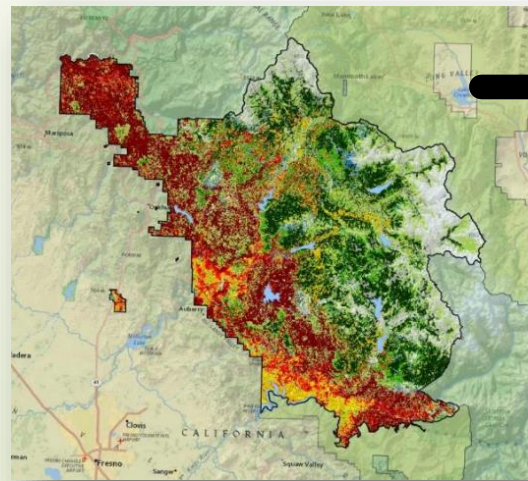
Potential Operational Delineations (PODs)

- ▶ PODs are:
 - ▶ independent of risk assessments
 - ▶ operational containers for wildfires
 - ▶ follow ridges, rivers, and roads & PCL/SDI
 - ▶ likely to replace FMUs in WFDSS
 - ▶ in need of GIS support to ensure quality
- ▶ Not inherently complex but require coordination with partners in workshops.
- ▶ Promotes cross-boundary communication with partners and stakeholders.
- ▶ Several PODs in a single Fireshed.
- ▶ Can help evaluate fuels treatment needs.



QWRA + PODs = Strategic Response (SR)

- Pre-planned response to wildfire ignition.
- Commonly displayed by POD containers.
- Derived from QWRA:
 - sums the risk of all the pixels in the POD
 - shows if fire is “good” “bad” or “neutral”
 - *within and transmitted from the POD*
- Decisions in alignment with risk to values.
- Will eventually be in WFDSS.



Freshets & the R4 QWRA are Aligned

R4 QWRA shows Loss of Human Habitation:

