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#### Introduction

#### **Utah Area of Interest Summary Report**

The Area of Interest tool allows users of the Advanced Viewer application to define a specific location to further explore its wildfire risks. This information can then be exported, providing a detailed summary using attributes selected by the Utah Division of Forestry, Fire, and State Land. The data layers for many of these map products were created with publicly available data and information submitted by volunteer fire departments. These map products have been summarized explicitly for the active Area of Interest. To access all data layers as a GIS file, users must "export data as a .zip file" after creating an area of interest.



This report was designed so that information can be copied and pasted into other plans, reports, or documents depending on user needs.

Examples include, but are not limited to, Community Wildfire Protection Plans, Local Fire Plans, Fuels Mitigation Plans, Hazard Mitigation Plans, Homeowner Risk Assessments, and Forest Management or Stewardship Plans.

The Utah Wildfire Risk Assessment provides a consistent, comparable set of scientific results to be used as a foundation for wildfire mitigation and prevention planning in Utah.

Results of an assessment can be used to help prioritize areas in the state where mitigation treatments, community interaction, and education or tactical analyses might be necessary to reduce risk from wildfires.

The Utah Wildfire Risk Explorer's map products and descriptions included in this summary report are designed to provide the information needed in support of the following key priorities:

- Identify areas that are most prone to wildfire.
- Plan and prioritize fuel treatment within programs.
- Allow agencies to work together to better define priorities and improve emergency response, particularly across jurisdictional boundaries.
- Increase communication with local residents and the public to address community priorities and needs.
- Identify areas where additional tactical planning may be desirable, specifically related to mitigation projects and Community Wildfire Protection Planning.
- Provide the information necessary to support resource, budget, and funding requests.
- Plan for response and wildfire suppression resource needs.

#### **Map Products and Descriptions**

Each map product in this Summary Report is accompanied by a general description, table, chart, or map. Please see the table below for a list of data layers available in the Summary Report.

Utah WRAP Layer	Description
Fire History Statistics	Fire history statistics provide insight as to the number of fires, acres burned, and cause of fires, and are useful for fire prevention and mitigation planning.
Wildfire Hazard Potential	The wildfire hazard potential (WHP) dataset represents an index that quantifies the relative potential for wildfire that may be difficult to control.
Risk to Drinking Watersheds and Population	The Risk to Drinking Watersheds and Population layer was created by multiplying wildfire threat (in the form of the Structure Exposure Score) by potential impacts (in a metric incorporating three factors: the Suppression Difficulty Index, estimated surface drinking water importance, and population density).
Burn Probability	This dataset is a 30-m cell size raster representing annual burn probability (BP) across the analysis area.
Damage Potential	Damage Potential (DP) represents the potential consequences of fire to a home at a given location if a fire were to occur and if a home were located there.
Structure Exposure Score	Structure Exposure Score (SES) combines wildfire likelihood (burn probability) and consequence (represented by Damage Potential) assuming a home is present on every pixel.
Conditional Risk to Potential Structures	The conditional risk to potential structures (cRPS) dataset represents the potential consequences of fire to a home at a given location, if a fire occurs there and if a home were located there.
Risk to Potential Structures	The expected risk to potential structures (RPS) dataset represents a measure that integrates wildfire likelihood and intensity with generalized consequences to a home on every pixel.
Probability of Exceeding Manual Control	This dataset represents the probability of heading flame lengths exceeding 4 feet, which is generally considered the threshold for exceeding the possibility of manual control during fire operations.
Probability of Exceeding Mechanical Control	This dataset represents the probability of heading flame lengths exceeding 8 feet, which is generally considered the threshold for exceeding the possibility of mechanical control during fire operations.
Probability of Extreme Fire Behavior	This dataset represents the probability of heading flame lengths exceeding 11 feet, which is generally considered the threshold for extreme fire behavior during fire operations.
Suppression Difficulty Index	Wildfire Suppression Difficulty Index is a quantitative rating of relative difficulty in performing fire control work.
Flame Length	This dataset represents the weighted-average flame length (FL) in feet for a given pixel in the fuelscape (including any contribution of crown fuel).
Rate of Spread (chains/hr)	This dataset represents the weighted-average rate of spread (ROS) in chains per hour for a given pixel in the fuelscape (including any contribution of crown fire spread rate).
Heat per Unit Area	This dataset represents the weighted-average heat per unit area (HPA) in kilojoules per square meter for a given pixel in the fuelscape (including any contribution of crown fuel).

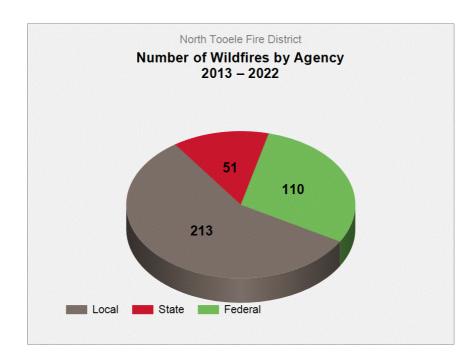
Utah WRAP Layer	Description
Conditional Ember Production	This dataset indicates where embers are originating when fires occur (so they could be targeted for treatment).
Conditional Sources of Ember Load to Buildings	This dataset indicates where embers might land near buildings.
Housing-Unit Density (HUDEN)	This layer displays housing-unit density.

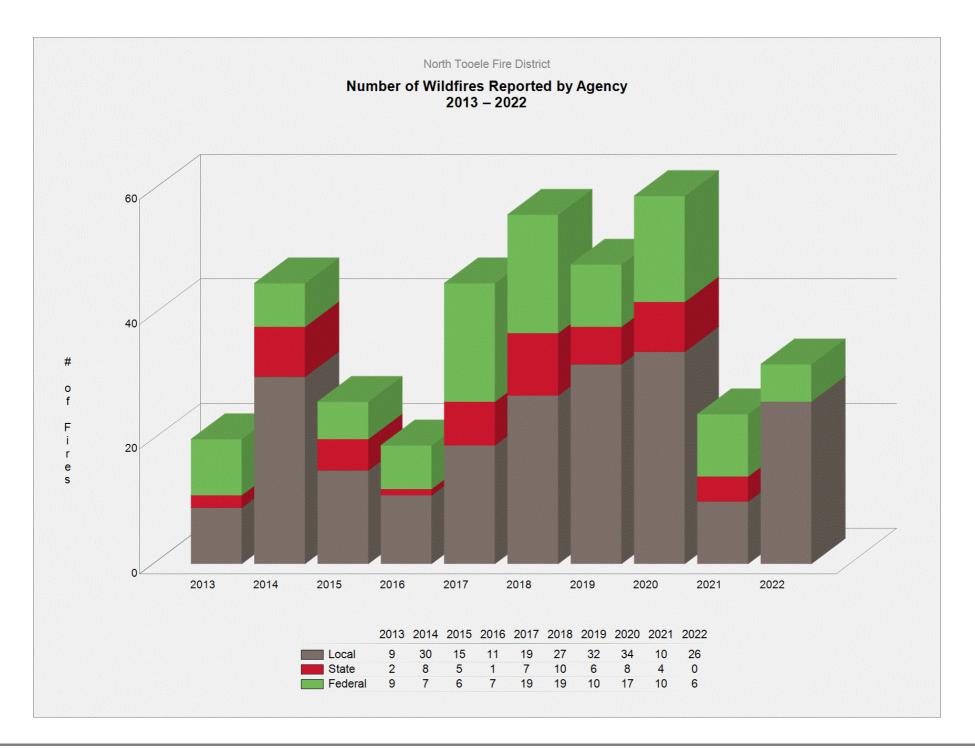
### **Fire History Statistics**

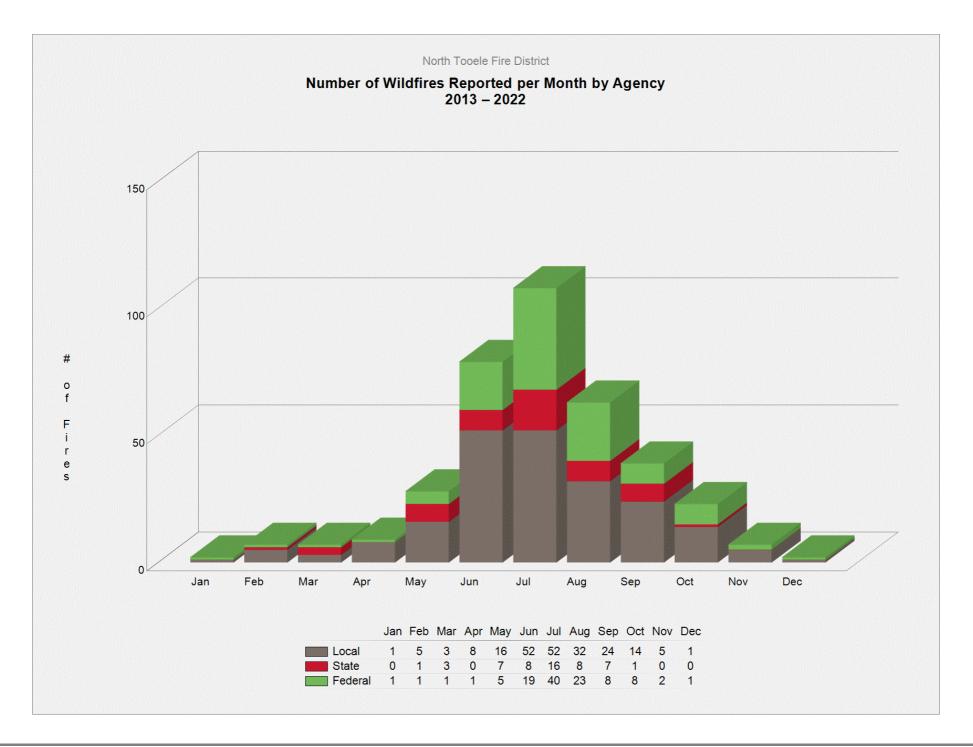
#### **Description**

**Fire history statistics provide insight into data related to reported wildfires in Utah.** These statistics are useful for fire prevention and mitigation planning. They can be used to quantify the level of fire business, determine the time of year most fires typically occur and develop a fire prevention program aimed at reducing the fire occurrence rate based on specific fire cause information.

Ten years of historic fire report data where fires had a specific defined location were used to create the fire occurrence summary charts. Wildfire Ignition data was compiled from federal and state sources for the years 2013 through 2022.



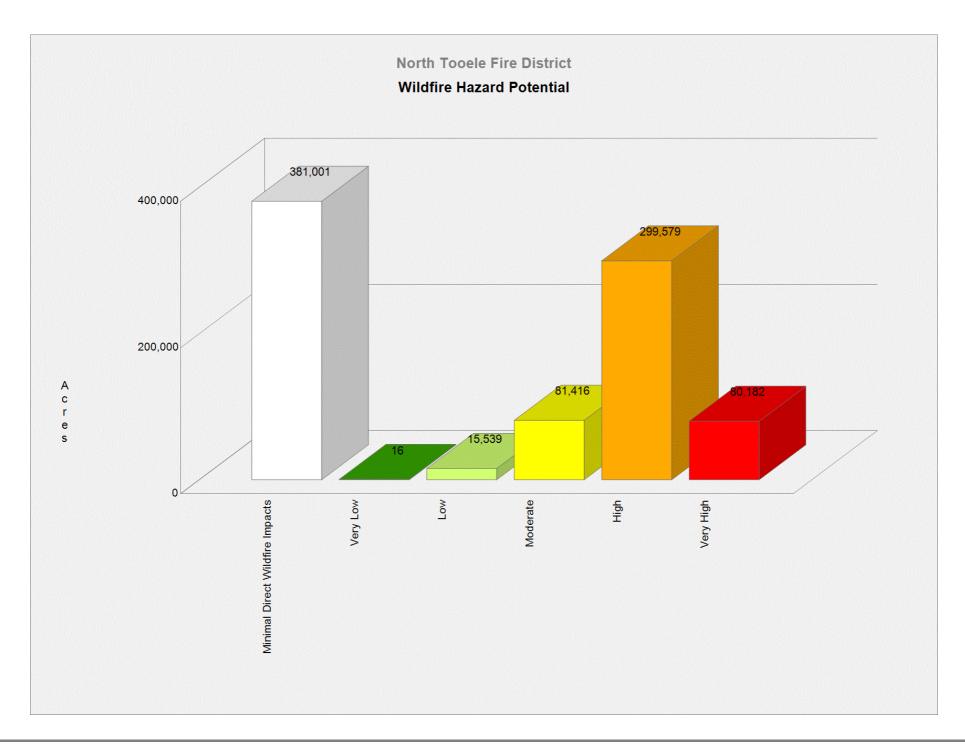


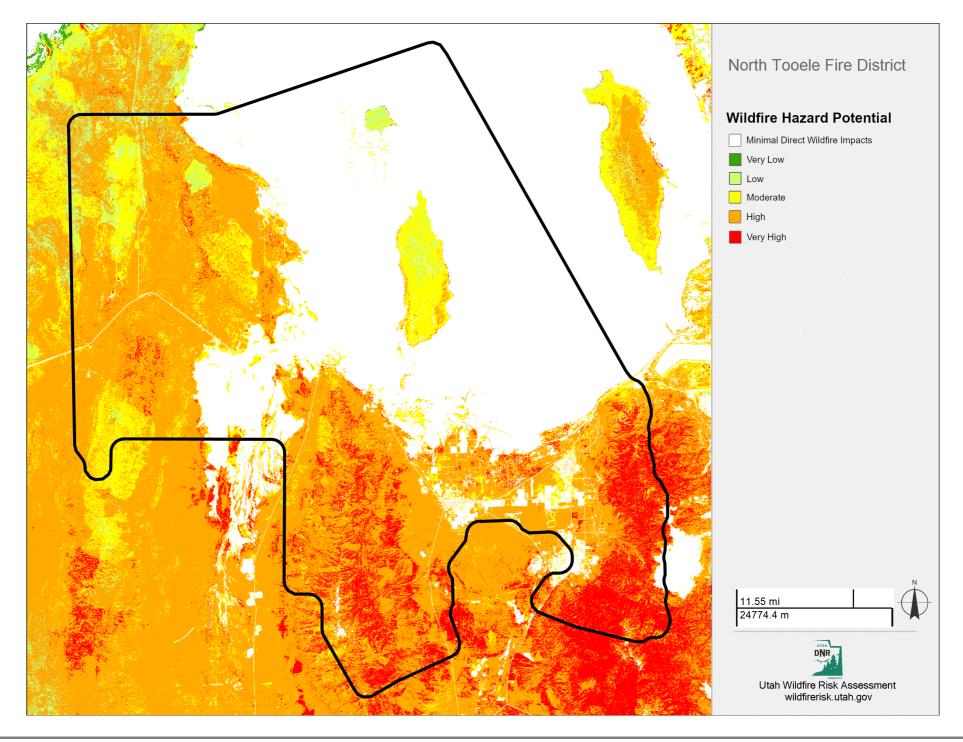


### **Wildfire Hazard Potential**

The wildfire hazard potential (WHP) dataset represents an index that quantifies the relative potential for wildfire that may be difficult to control. WHP can be used as a measure to help prioritize where fuel treatments may be needed.

Wildfire Hazard Potential Category	Acres	Percent
Minimal Direct Wildfire Impacts	381,001	44.4 %
Very Low	16	0.0 %
Low	15,539	1.8 %
Moderate	81,416	9.5 %
High	299,579	34.9 %
Very High	80,182	9.3 %
Total	857,733	100.0 %

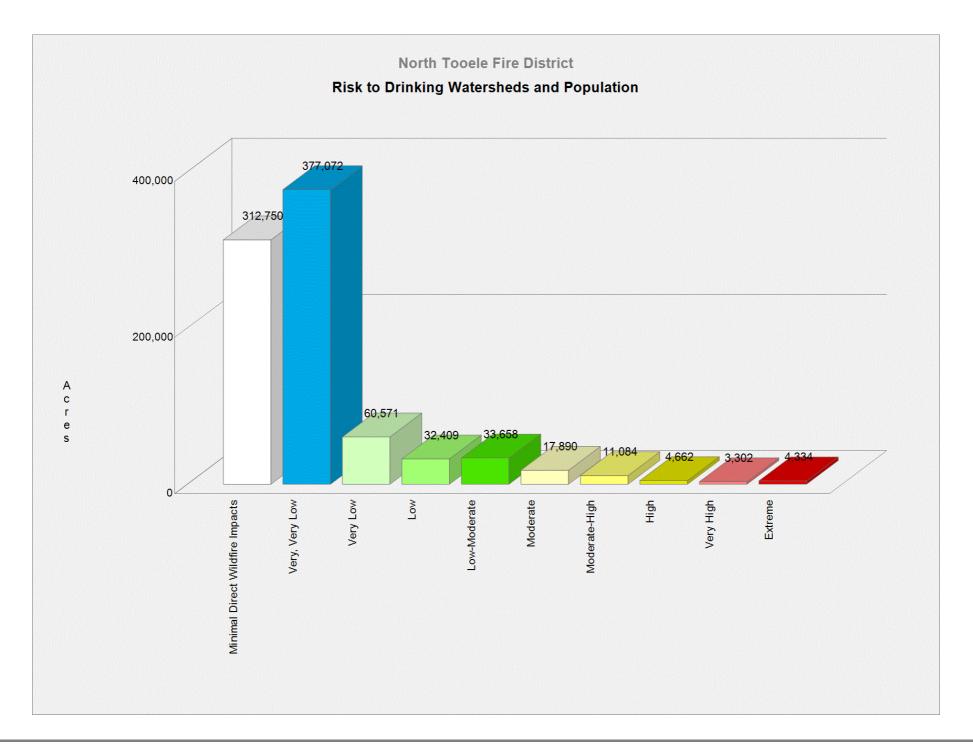


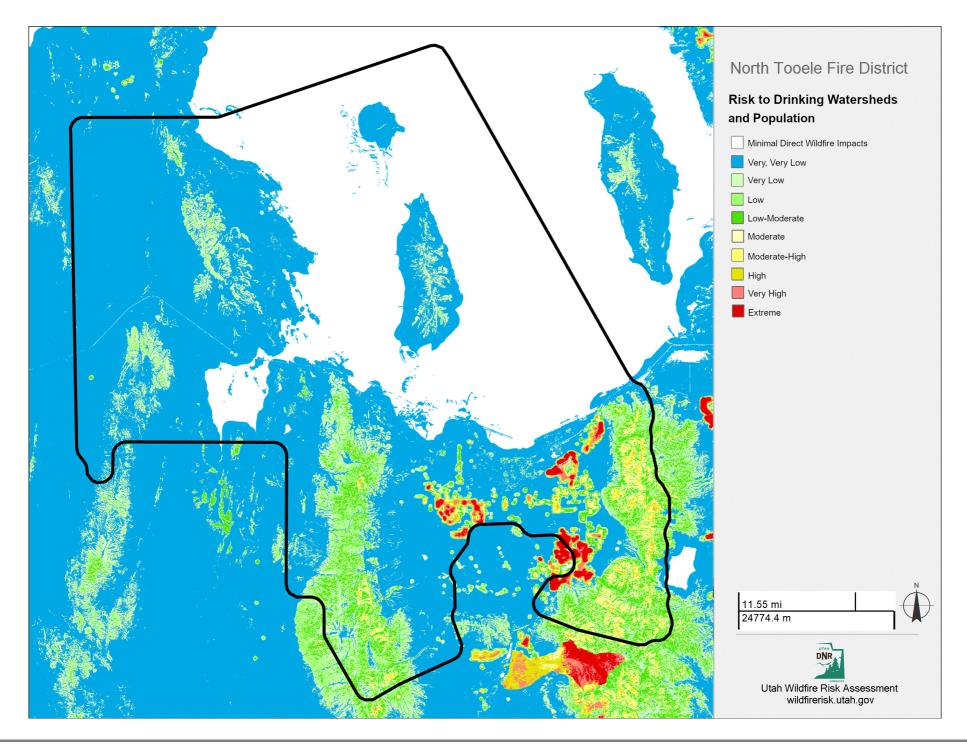


## **Risk to Drinking Watersheds and Population**

The Risk to Drinking Watersheds and Population layer was created by multiplying wildfire threat (in the form of the Structure Exposure Score) by potential impacts (in a metric incorporating three factors: the Suppression Difficulty Index, estimated surface drinking water importance, and population density).

Risk to Drinking Watersheds and Population Category	Acres	Percent
Minimal Direct Wildfire Impacts	312,750	36.5 %
Very, Very Low	377,072	44.0 %
Very Low	60,571	7.1 %
Low	32,409	3.8 %
Low-Moderate	33,658	3.9 %
Moderate	17,890	2.1 %
Moderate-High	11,084	1.3 %
High	4,662	0.5 %
Very High	3,302	0.4 %
Extreme	4,334	0.5 %
Total	857,732	100.0 %



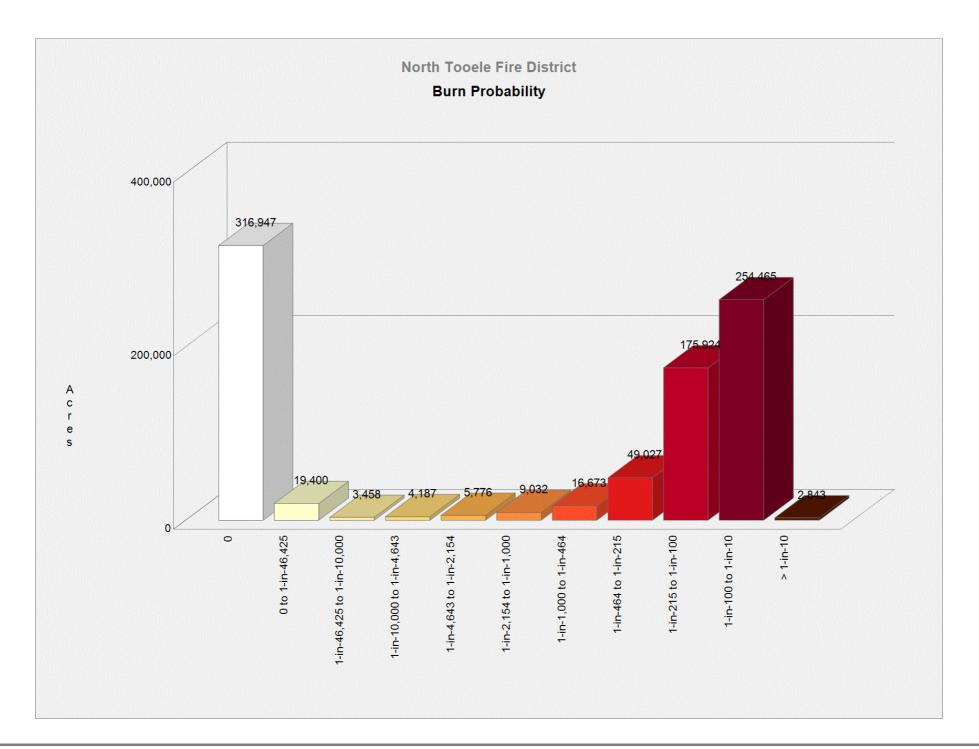


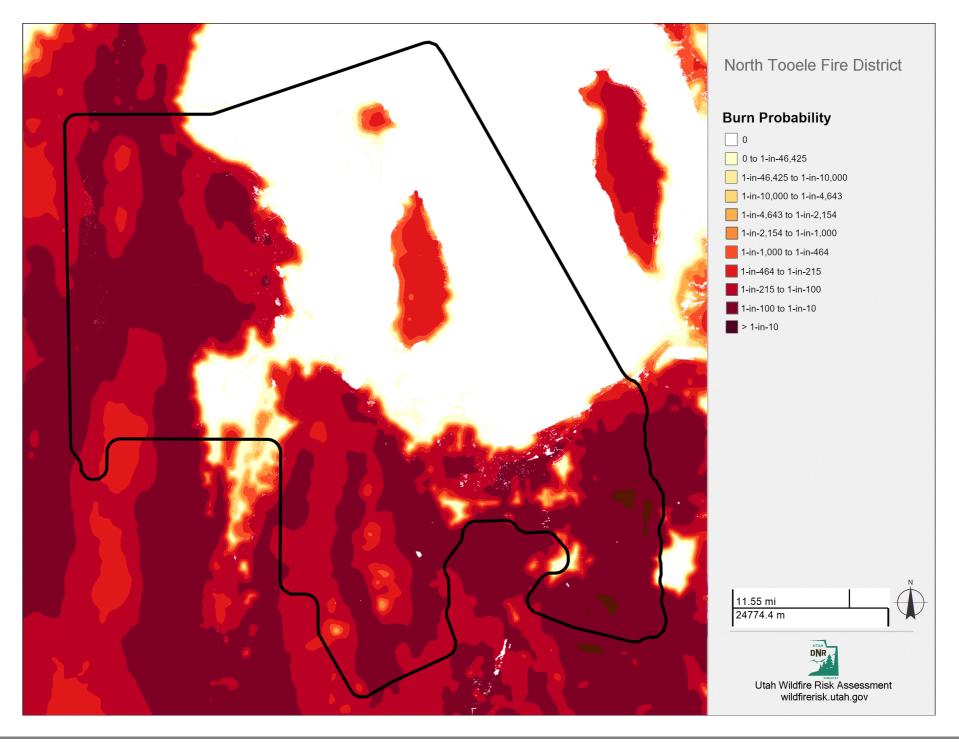
### **Burn Probability**

Burn probability is the annual probability of wildfire burning in a specific location. At the community level, burn probability or wildfire likelihood is averaged where housing units occur. Burn Probability is based on fire behavior modeling across thousands of simulations of possible fire seasons. In each simulation, factors contributing to the probability of a fire occurring, including weather, topography, and ignitions are varied based on patterns derived from observations in recent decades.

Burn Probability is not predictive and does not reflect any currently forecasted weather or fire danger conditions. Burn Probability is simply a probability that any specific location (pixel) may experience wildfire in any given year. It does not say anything about the intensity of fire if it occurs.

Burn Probability Category	Acres	Percent
Minimal Direct Wildfire Impacts	316,947	37.0 %
0 to 1-in-46,425	19,400	2.3 %
1-in-46,425 to 1-in-10,000	3,458	0.4 %
1-in-10,000 to 1-in-4,643	4,187	0.5 %
1-in-4,643 to 1-in-2,154	5,776	0.7 %
1-in-2,154 to 1-in-1,000	9,032	1.1 %
1-in-1,000 to 1-in-464	16,673	1.9 %
1-in-464 to 1-in-215	49,027	5.7 %
1-in-215 to 1-in-100	175,924	20.5 %
1-in-100 to 1-in-10	254,465	29.7 %
> 1-in-10	2,843	0.3 %
Total	857,732	100.0 %

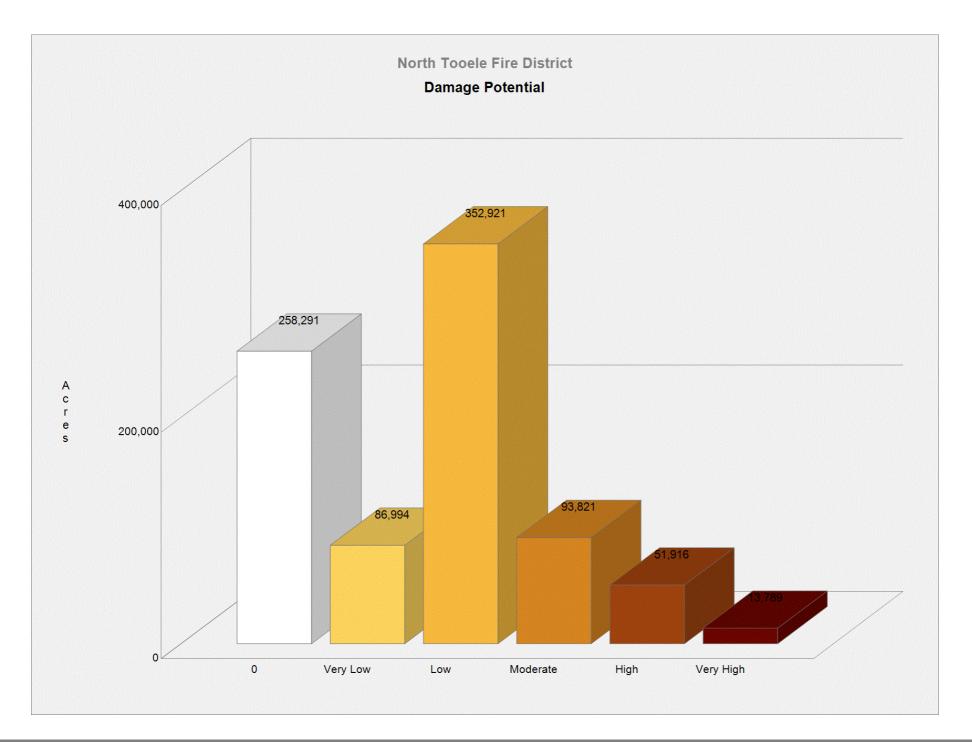


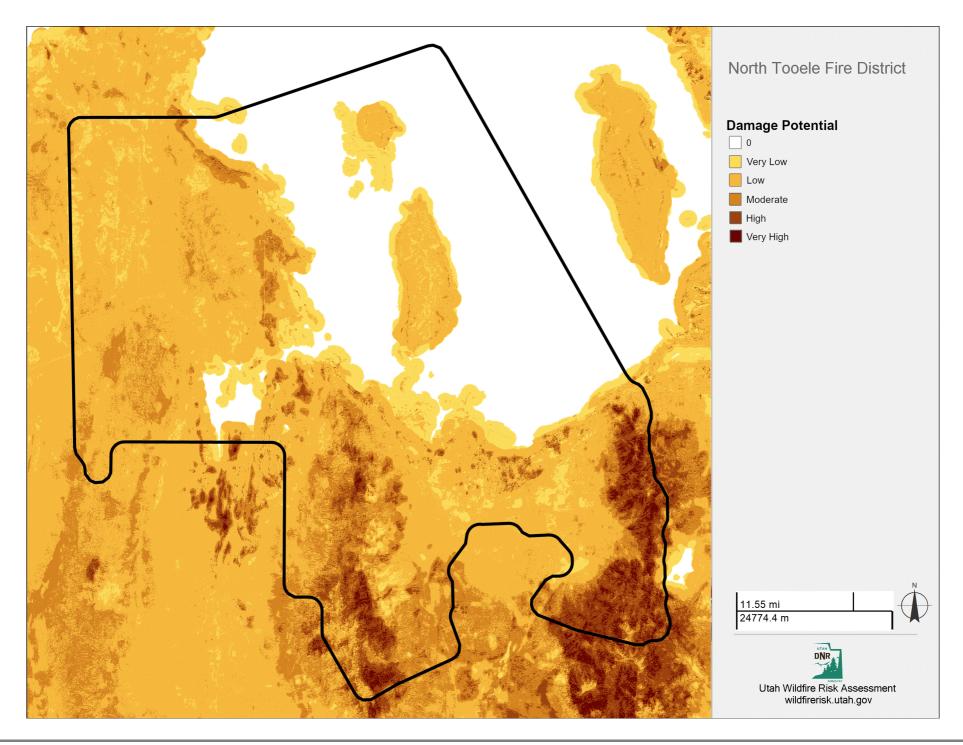


## **Damage Potential**

Damage Potential (DP) represents the potential consequences of fire to a home at a given location if a fire were to occur and if a home were located there. DP incorporates ember load and conditional risk to potential structures as a generalized measure of potential loss to homes.

Damage Potential Category	Acres	Percent
Minimal Direct Wildfire Impacts	258,291	30.1 %
Very Low	86,994	10.1 %
Low	352,921	41.1 %
Moderate	93,821	10.9 %
High	51,916	6.1 %
Very High	13,789	1.6 %
Total	857,732	100.0 %

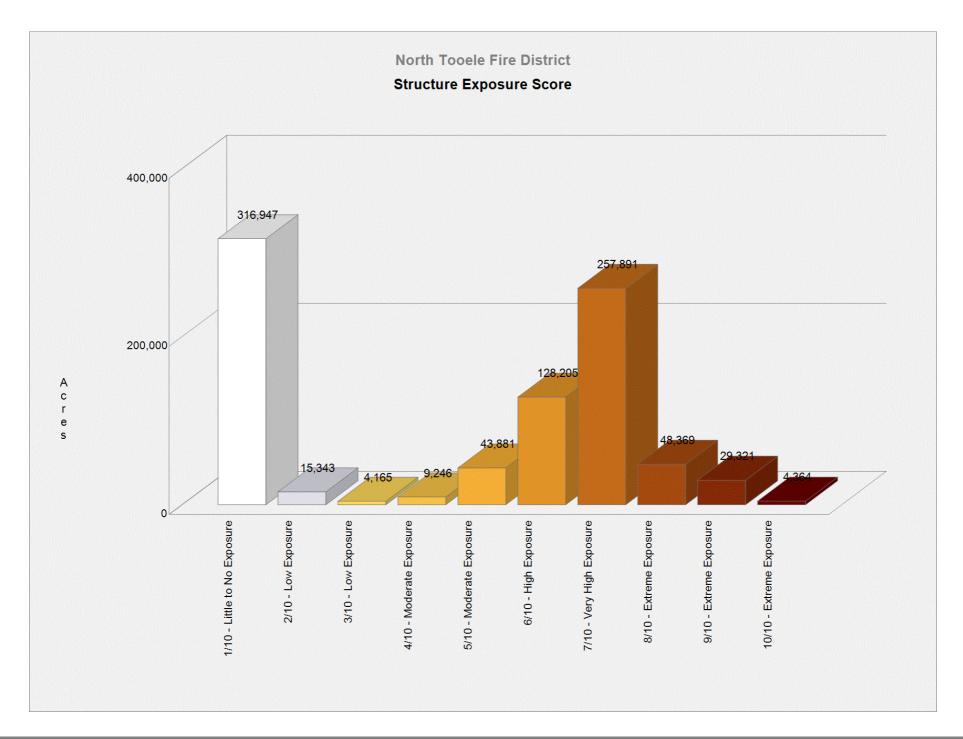


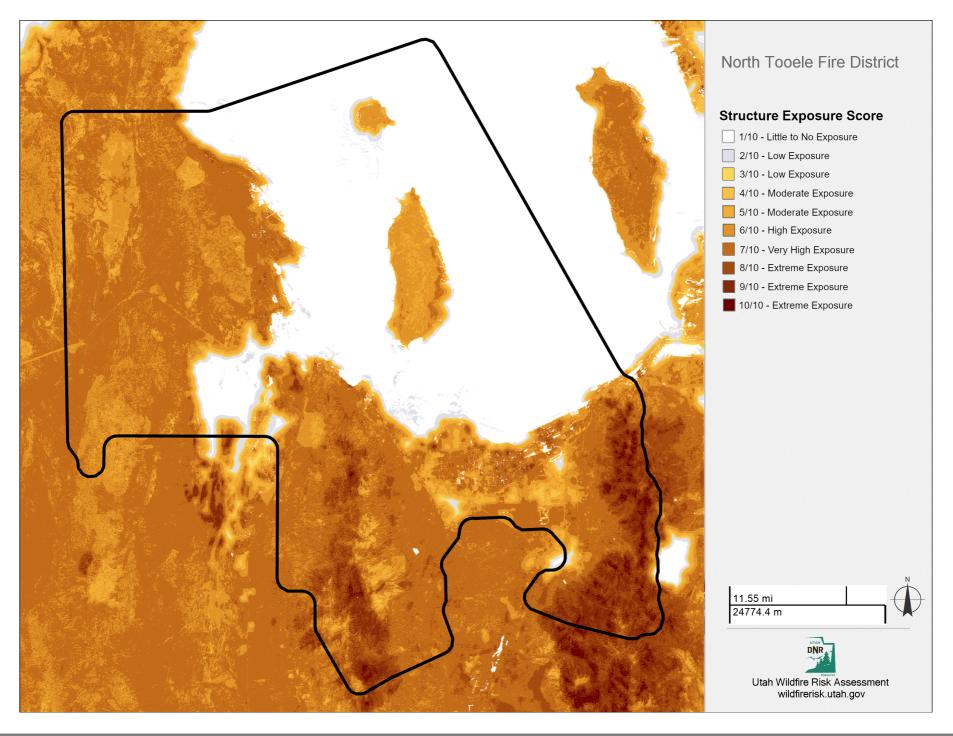


# **Structure Exposure Score**

Structure Exposure Score (SES) combines wildfire likelihood (burn probability) and consequence (represented by Damage Potential) assuming a home is present on every pixel. SES is analogous to the Risk to Potential Structures dataset but includes ember load.

Structure Exposure Score Category	Acres	Percent
1/10 - Little to No Exposure	316,947	37.0 %
2/10 - Low Exposure	15,343	1.8 %
3/10 - Low Exposure	4,165	0.5 %
4/10 - Moderate Exposure	9,246	1.1 %
5/10 - Moderate Exposure	43,881	5.1 %
6/10 - High Exposure	128,205	14.9 %
7/10 - Very High Exposure	257,891	30.1 %
8/10 - Extreme Exposure	48,369	5.6 %
9/10 - Extreme Exposure	29,321	3.4 %
10/10 - Extreme Exposure	4,364	0.5 %
Total	857,732	100.0 %

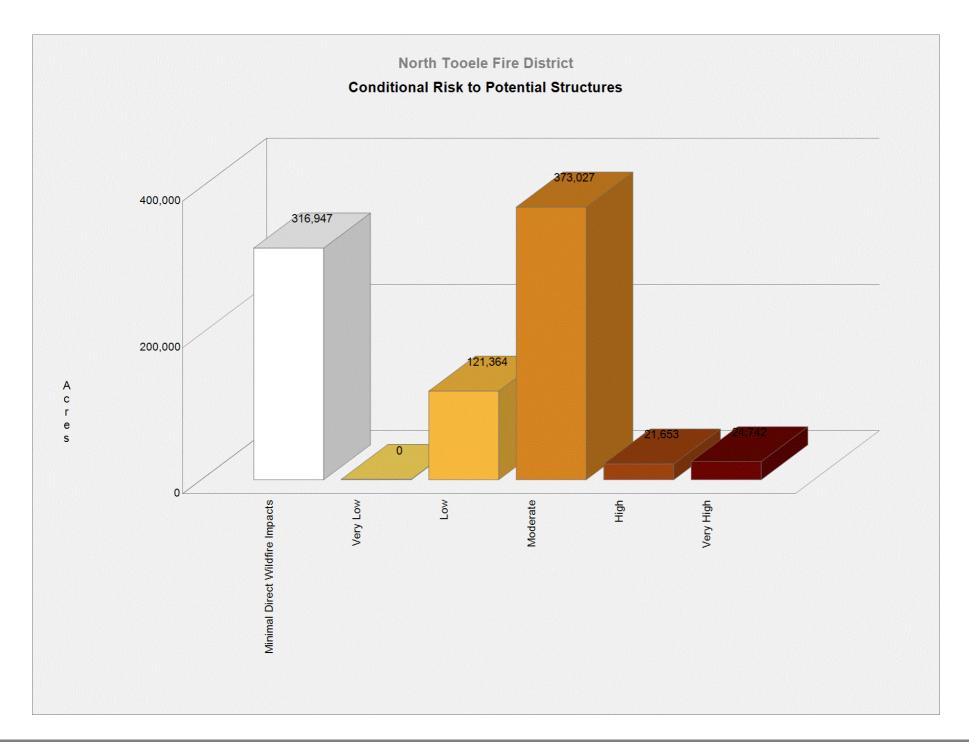


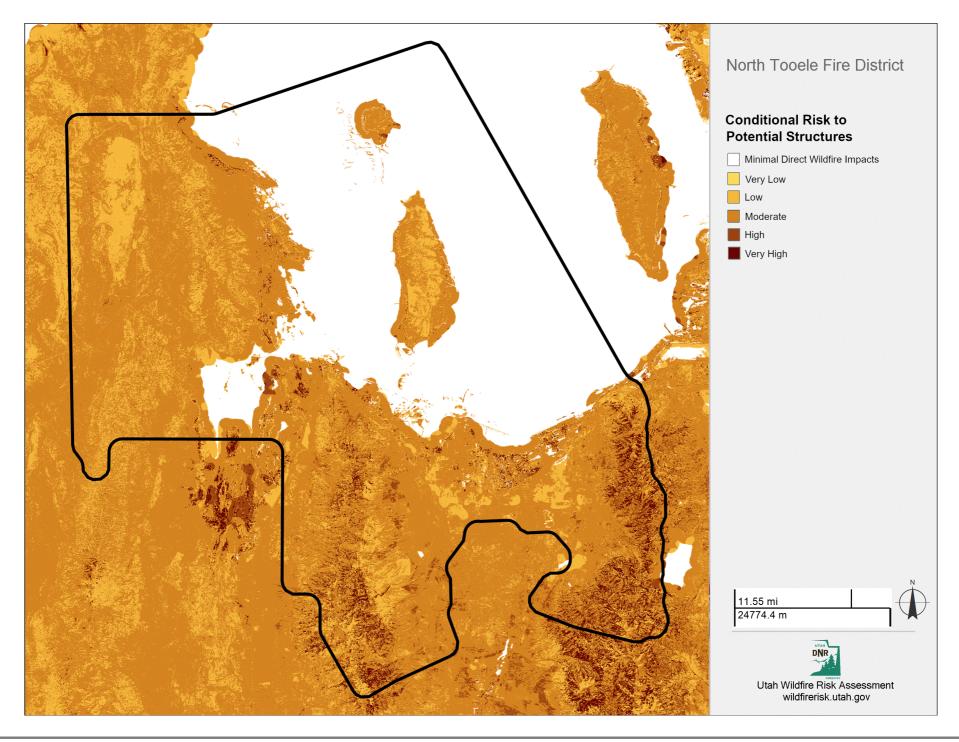


### **Conditional Risk to Potential Structures**

The conditional risk to potential structures (cRPS) dataset or "Risk to Homes" represents the potential consequences of fire to a home at a given location, if a fire occurs there and if a home were located there. It is a measure that integrates wildfire intensity with generalized consequences to a home on every pixel, but does not account for the actual probability of fire occurrence.

Conditional Risk to Potential Structures Category	Acres	Percent
Minimal Direct Wildfire Impacts	316,947	37.0 %
Very Low	0	0.0 %
Low	121,364	14.1 %
Moderate	373,027	43.5 %
High	21,653	2.5 %
Very High	24,742	2.9 %
Total	857,733	100.0 %

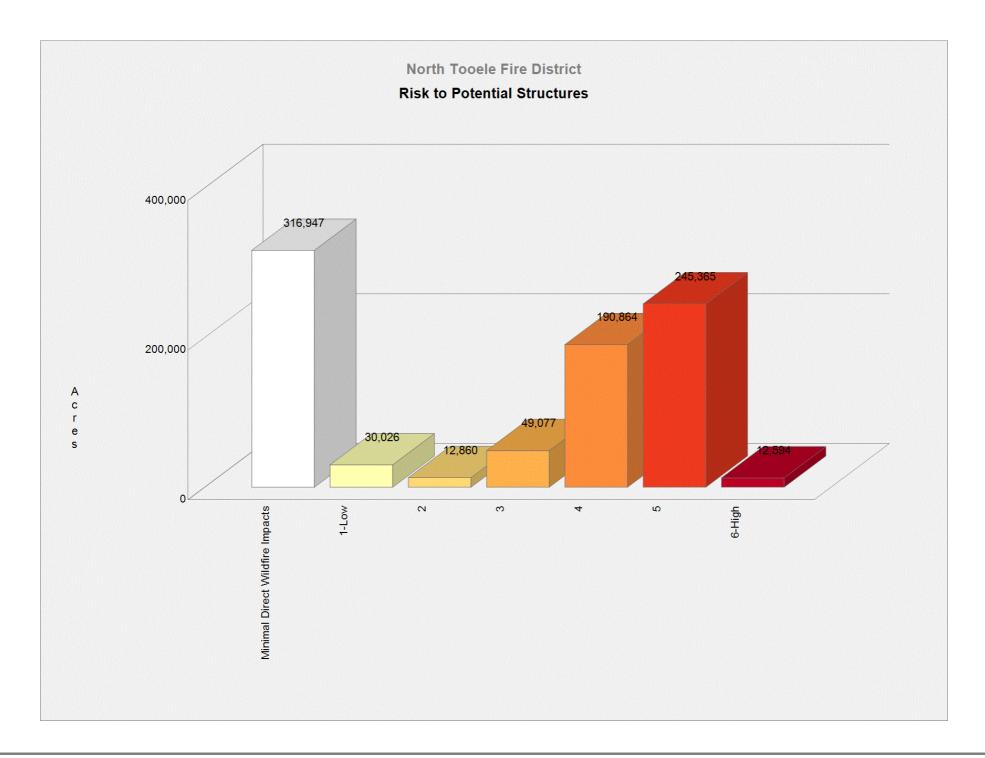


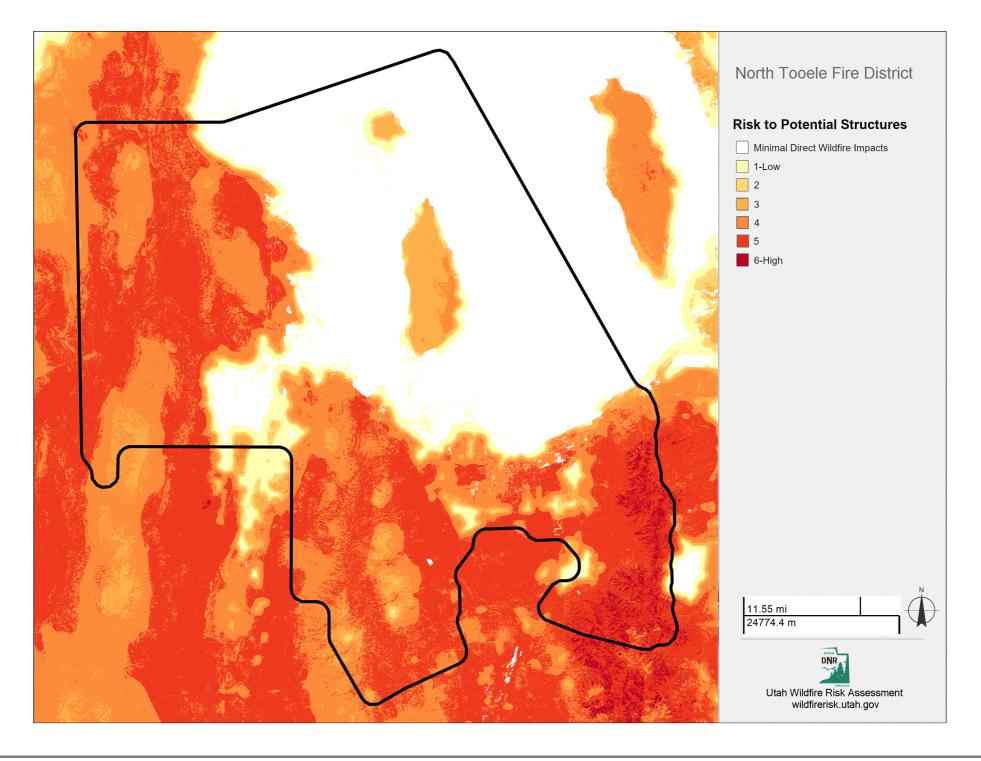


#### **Risk to Potential Structures**

The expected risk to potential structures (RPS) dataset represents a measure that integrates wildfire likelihood and intensity with generalized consequences to a home on every pixel. For every place on the landscape, it poses the hypothetical question, "What would be the relative risk to a house if one existed here?" This allows comparison of wildfire risk in places where homes already exist to places where new construction may be proposed.

Risk to Potential Structures Category	Acres	Percent
Minimal Direct Wildfire Impacts	316,947	37.0 %
1-Low	30,026	3.5 %
2	12,860	1.5 %
3	49,077	5.7 %
4	190,864	22.3 %
5	245,365	28.6 %
6-High	12,594	1.5 %
Total	857,733	100.0 %

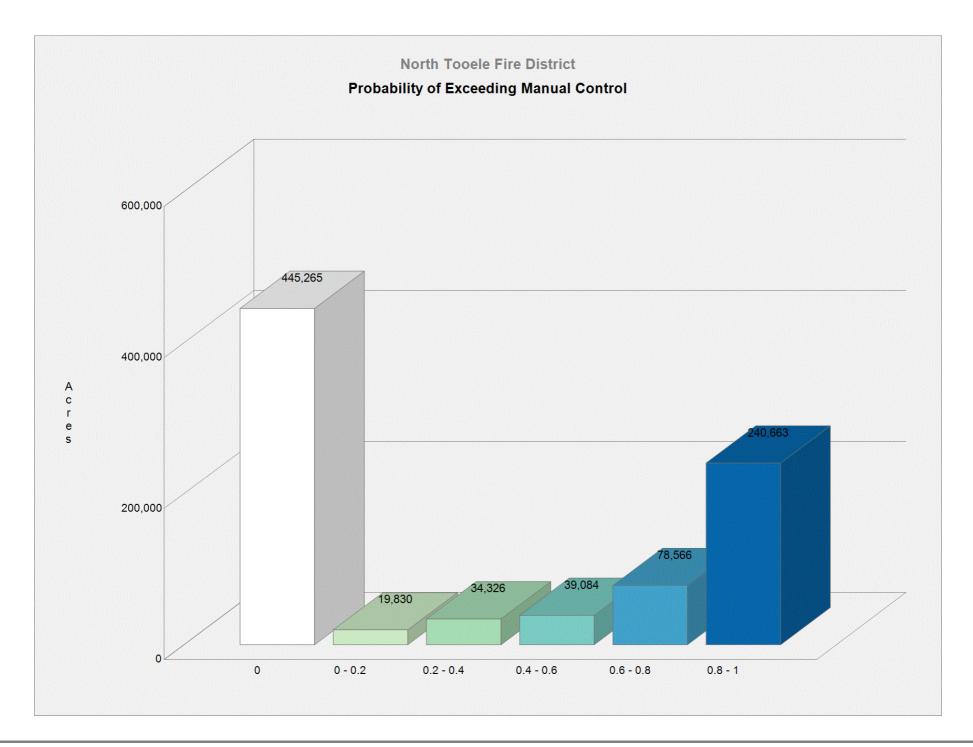


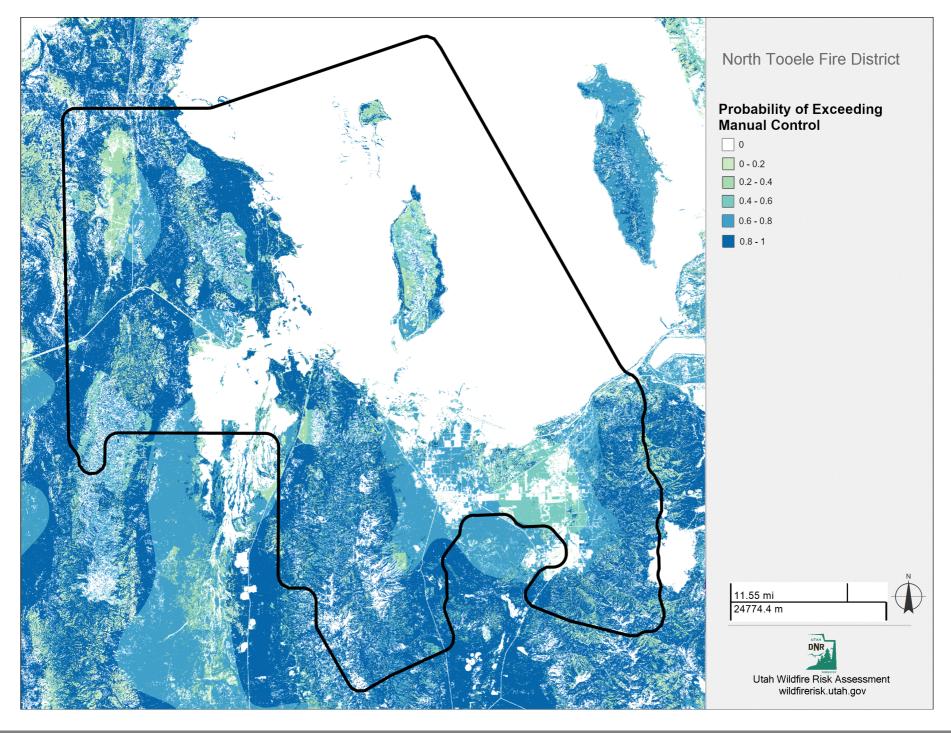


# **Probability of Exceeding Manual Control**

This dataset represents the probability of heading flame lengths exceeding 4 feet, which is generally considered the threshold for exceeding the possibility of manual control during fire operations.

Probability of Exceeding Manual Control Category	Acres	Percent
0	445,265	51.9 %
0 - 0.2	19,830	2.3 %
0.2 - 0.4	34,326	4.0 %
0.4 - 0.6	39,084	4.6 %
0.6 - 0.8	78,566	9.2 %
0.8 - 1	240,663	28.1 %
Total	857,734	100.0 %

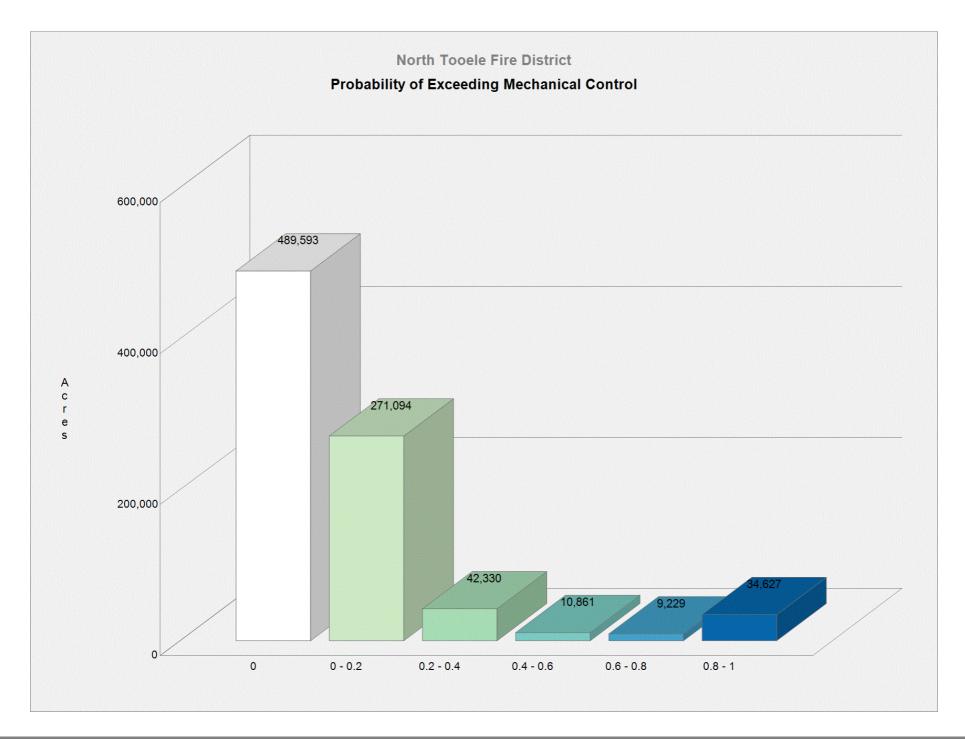


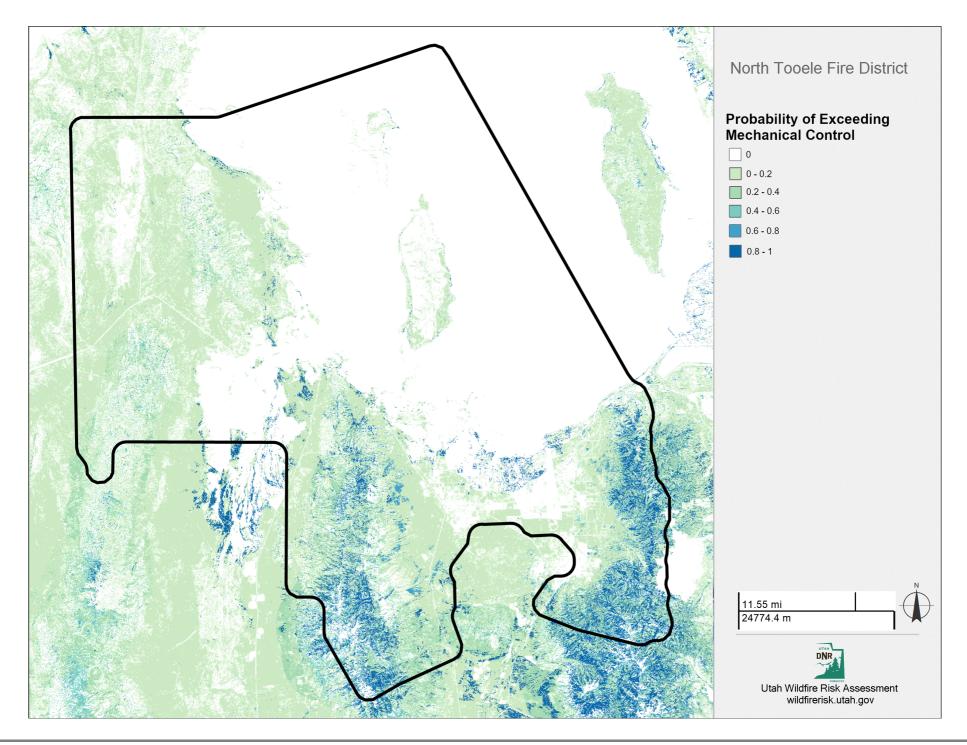


# **Probability of Exceeding Mechanical Control**

This dataset represents the probability of heading flame lengths exceeding 8 feet, which is generally considered the threshold for exceeding the possibility of mechanical control during fire operations.

Probability of Exceeding Mechanical Control Category	Acres	Percent
0	489,593	57.1 %
0 - 0.2	271,094	31.6 %
0.2 - 0.4	42,330	4.9 %
0.4 - 0.6	10,861	1.3 %
0.6 - 0.8	9,229	1.1 %
0.8 - 1	34,627	4.0 %
Total	857,734	100.0 %

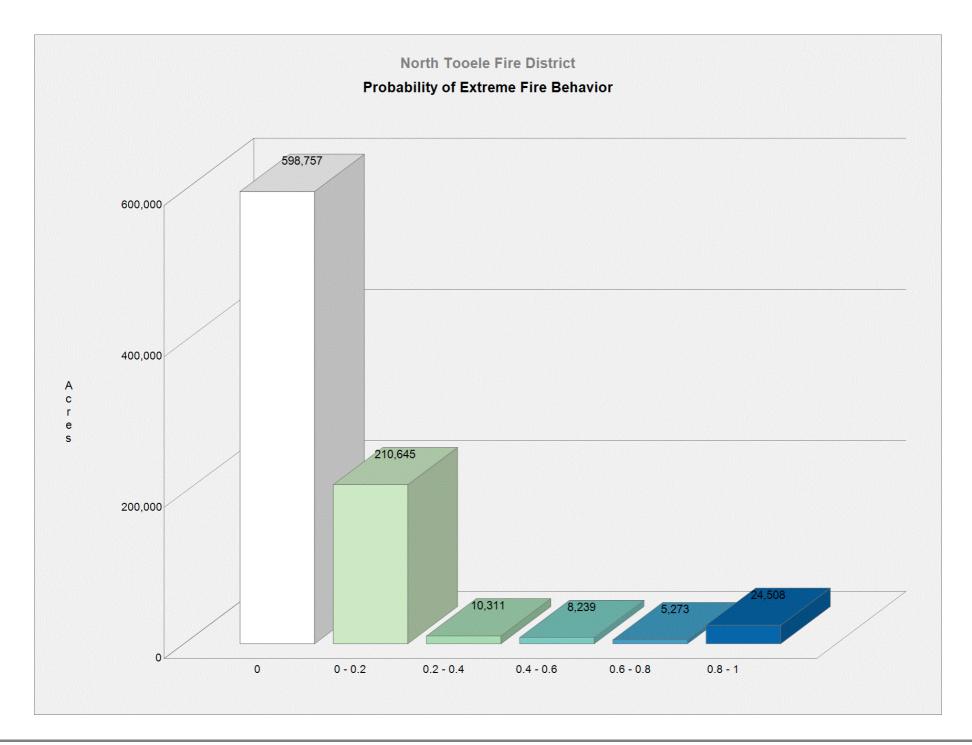


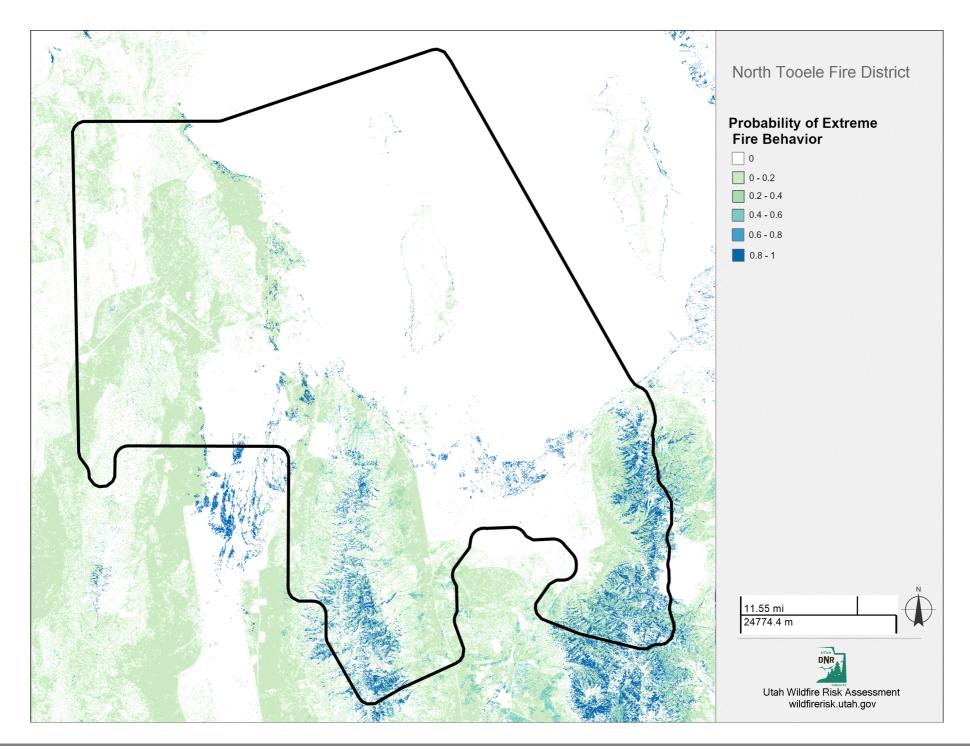


# **Probability of Extreme Fire Behavior**

This dataset represents the probability of heading flame lengths exceeding 11 feet, which is generally considered the threshold for exceeding extreme fire behavior during fire operations.

Probability of Extreme Fire Behavior Category	Acres	Percent
0	598,757	69.8 %
0 - 0.2	210,645	24.6 %
0.2 - 0.4	10,311	1.2 %
0.4 - 0.6	8,239	1.0 %
0.6 - 0.8	5,273	0.6 %
0.8 - 1	24,508	2.9 %
Total	857,733	100.0 %

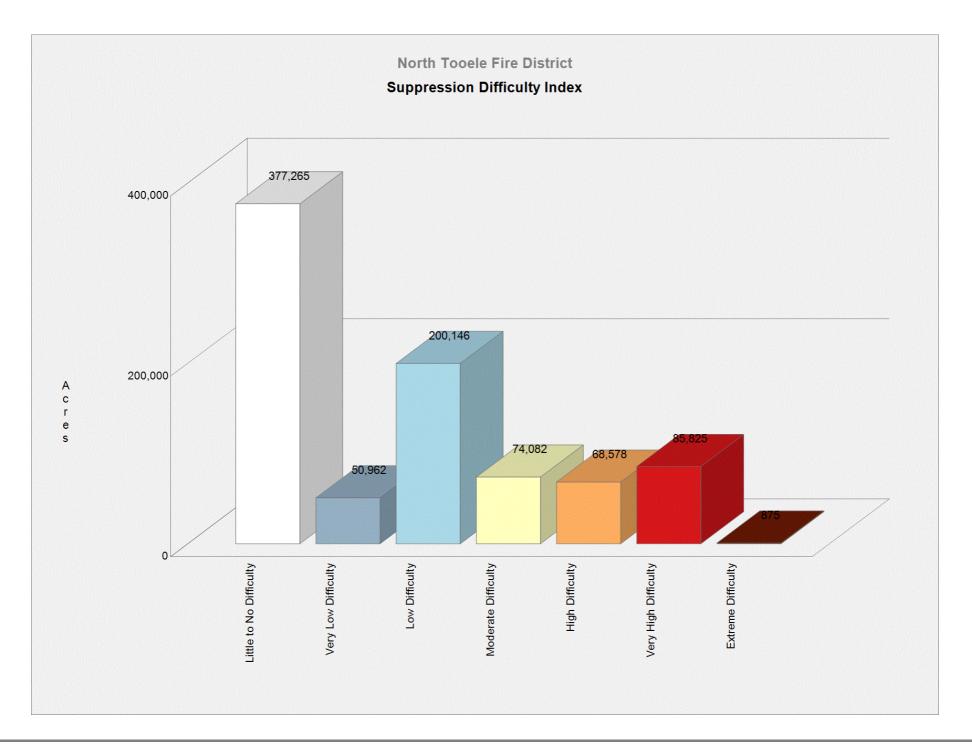


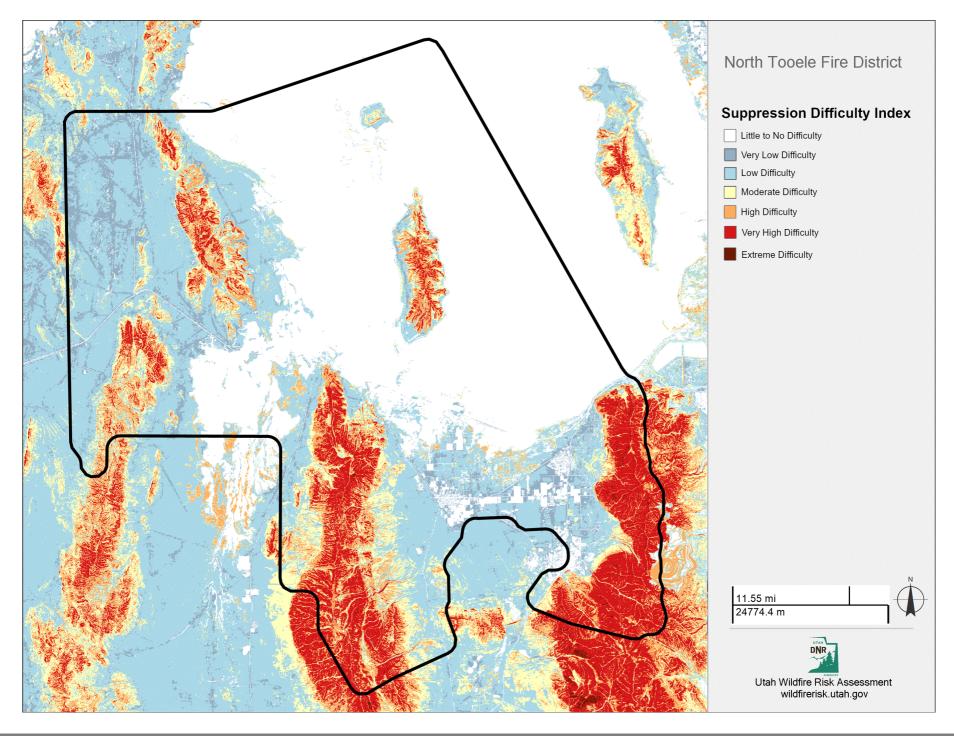


#### **Suppression Difficulty Index**

Wildfire Suppression Difficulty Index (SDI) is a quantitative rating of relative difficulty in performing fire control work. SDI factors in topography, fuels, expected fire behavior under severe fire weather conditions, firefighter line production rates in various fuel types, and accessibility (distance from roads/trails) to assess relative suppression difficulty.

Suppression Difficulty Index Category	Acres	Percent
Little to No Difficulty	377,265	44.0 %
Very Low Difficulty	50,962	5.9 %
Low Difficulty	200,146	23.3 %
Moderate Difficulty	74,082	8.6 %
High Difficulty	68,578	8.0 %
Very High Difficulty	85,825	10.0 %
Extreme Difficulty	875	0.1 %
Total	857,733	100.0 %



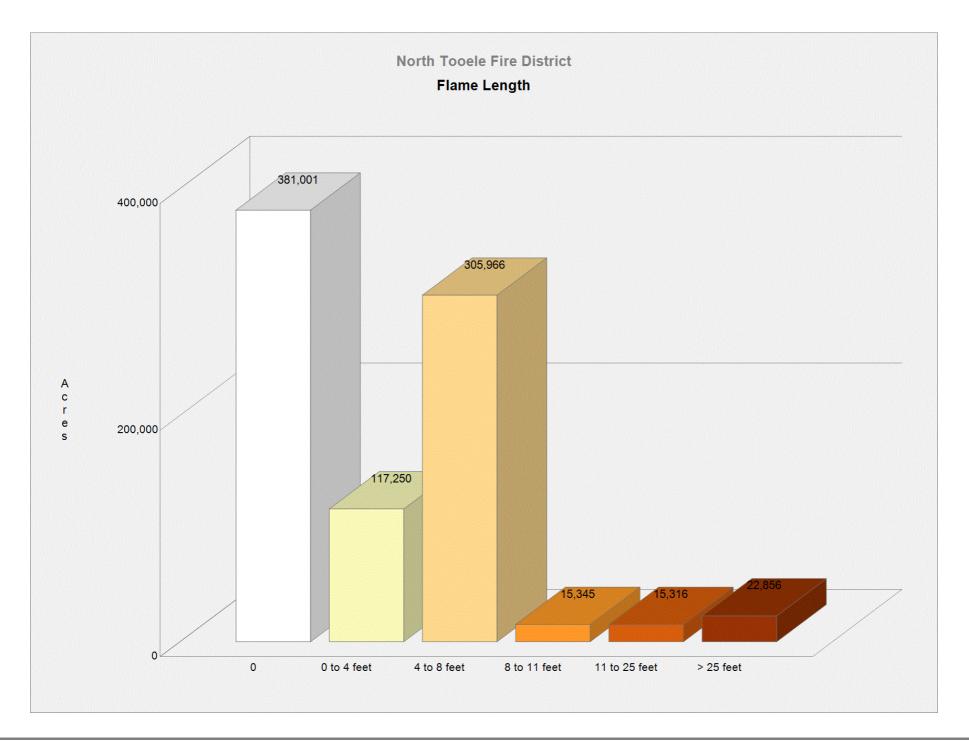


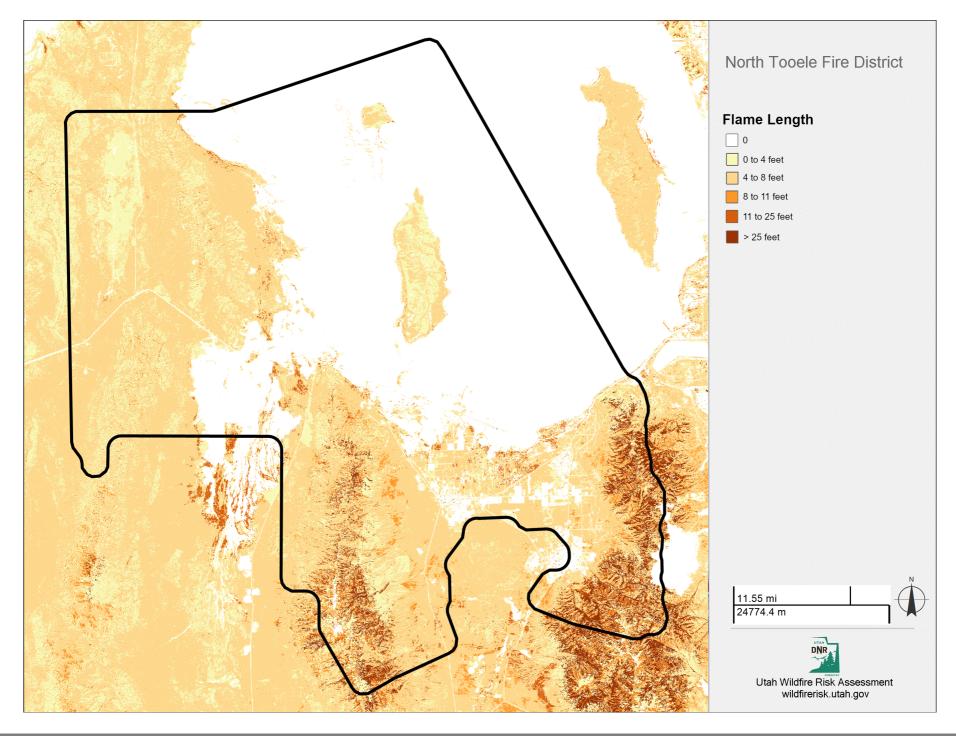
# Flame Length

This dataset represents the weighted-average flame length (FL) in feet for a given pixel in the fuelscape (including any contribution of crown fuel). Flame length is the distance (in feet) between the flame tip and the midpoint of the flame depth at the base (generally the ground surface). This is a good indicator of fire intensity. Flame length is a strong indicator of the potential damage to structures; longer flame lengths will likely have a greater negative consequence. Flame lengths are also utilized in fuel-break planning.

Flame Length Category	Acres	Percent
0	381,001	44.4 %
0 to 4 feet	117,250	13.7 %
4 to 8 feet	305,966	35.7 %
8 to 11 feet	15,345	1.8 %
11 to 25 feet	15,316	1.8 %
> 25 feet	22,856	2.7 %
Total	857,734	100.0 %



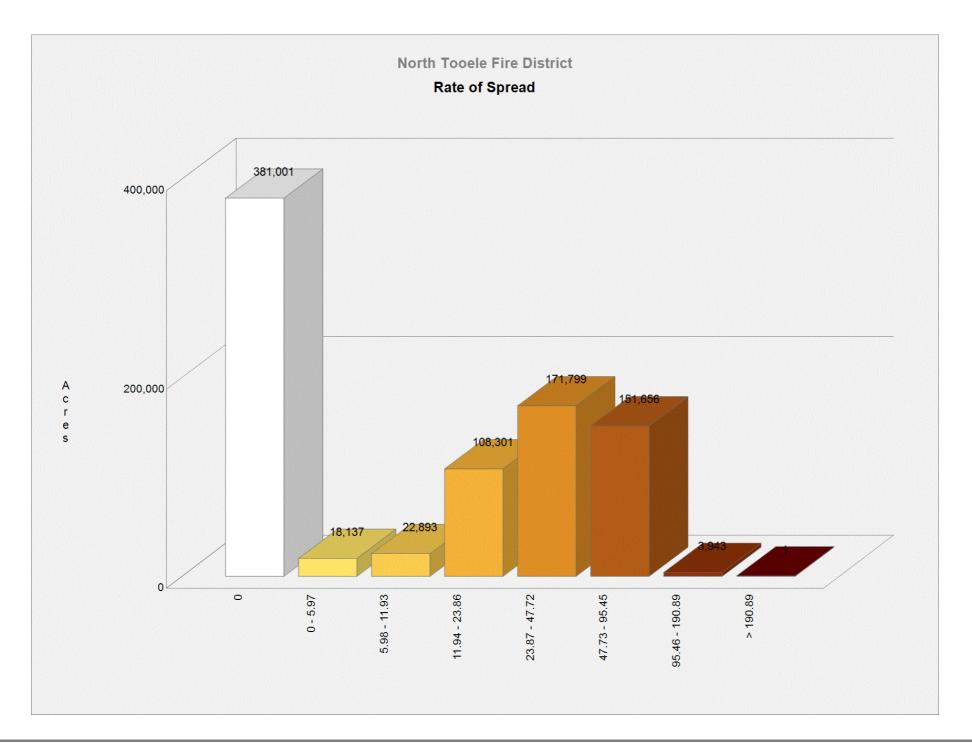


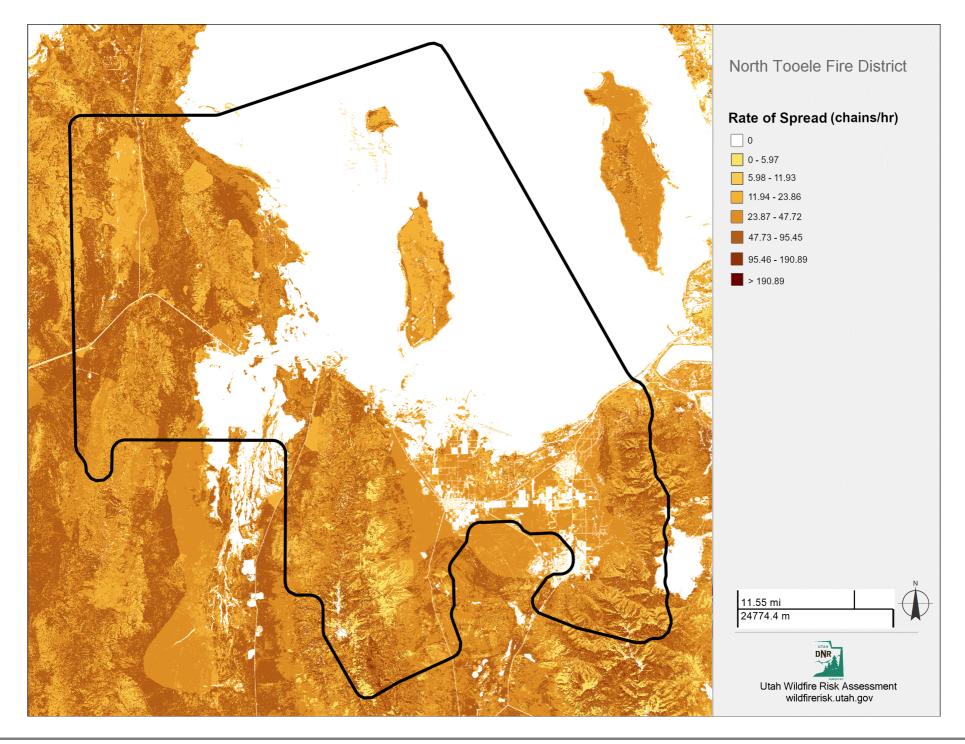


## Rate of Spread (chains/hr)

Rate of Spread (ROS) represents the weighted-average rate of spread in chains per hour for a given pixel in the fuelscape (including any contribution of crown fire spread rate). Rate of spread can affect suppression efforts by "outrunning" direct attack and can have an impact on evacuation.

Rate of Spread Category (chains/hr)	Acres	Percent
0	381,001	44.4 %
0 - 5.97	18,137	2.1 %
5.98 - 11.93	22,893	2.7 %
11.94 - 23.86	108,301	12.6 %
23.87 - 47.72	171,799	20.0 %
47.73 - 95.45	151,656	17.7 %
95.46 - 190.89	3,943	0.5 %
> 190.89	1	0.0 %
Total	857,731	100.0 %

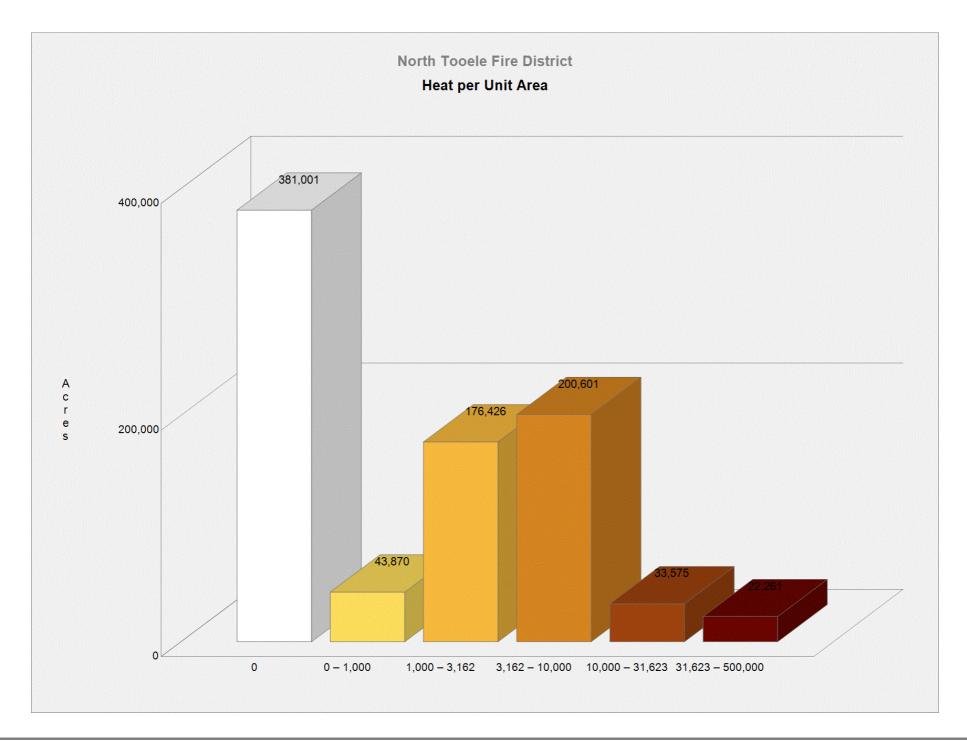


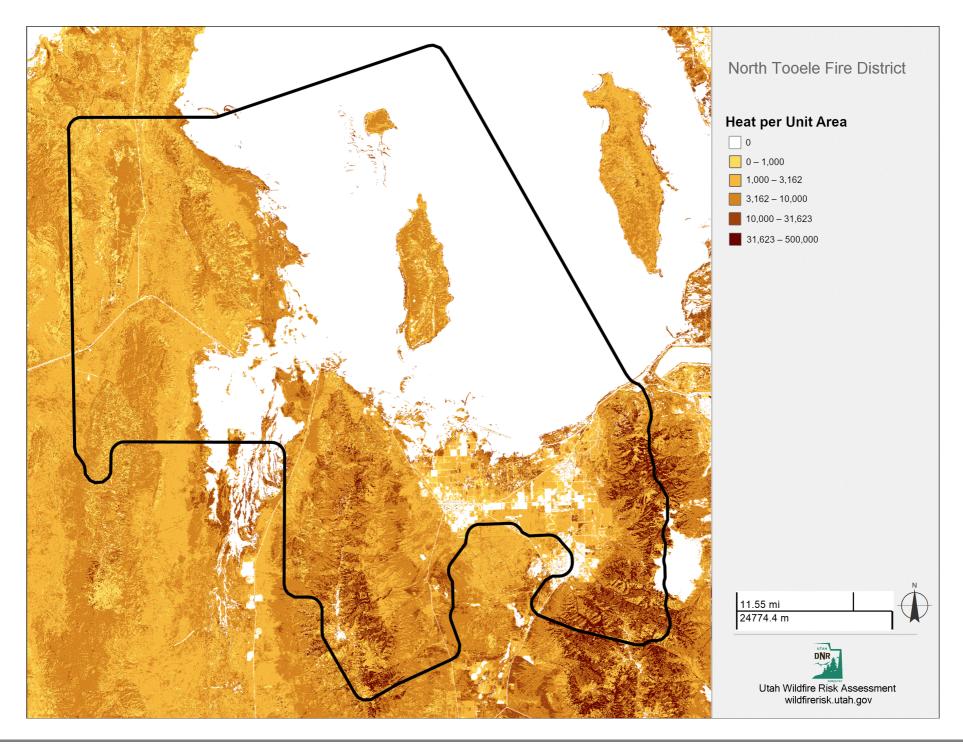


## **Heat per Unit Area**

This dataset represents the weighted-average heat per unit area (HPA) in kilojoules per square meter for a given pixel in the fuelscape (including any contribution of crown fuel).

Heat per Unit Area Category	Acres	Percent
0	381,001	44.4 %
0 – 1,000	43,870	5.1 %
1,000 – 3,162	176,426	20.6 %
3,162 – 10,000	200,601	23.4 %
10,000 – 31,623	33,575	3.9 %
31,623 – 500,000	22,261	2.6 %
Total	857,734	100.0 %

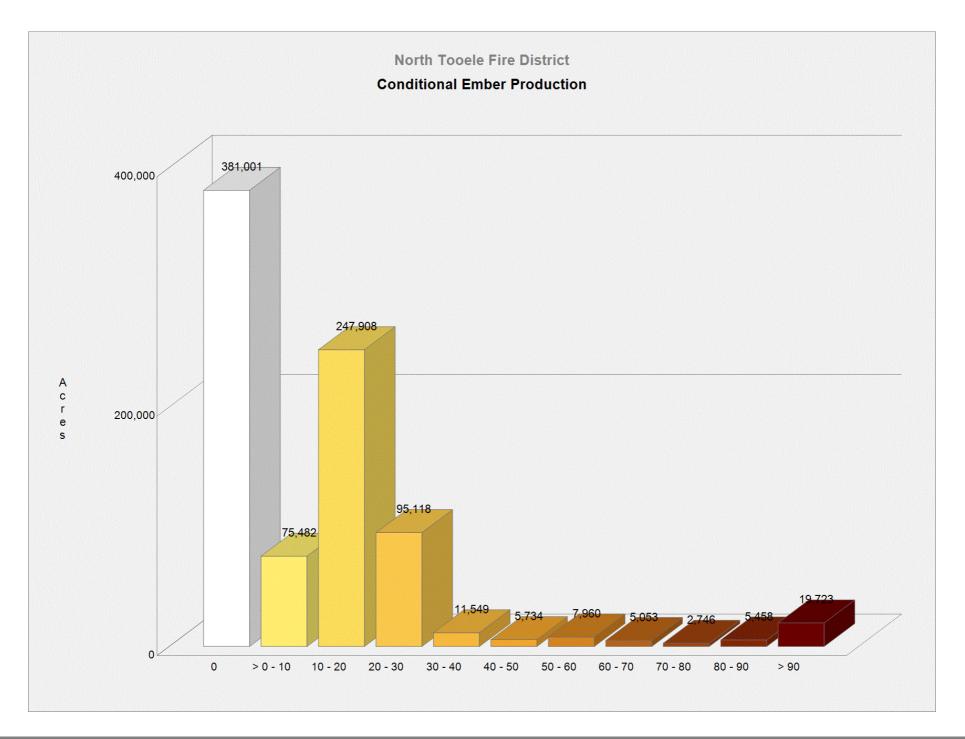


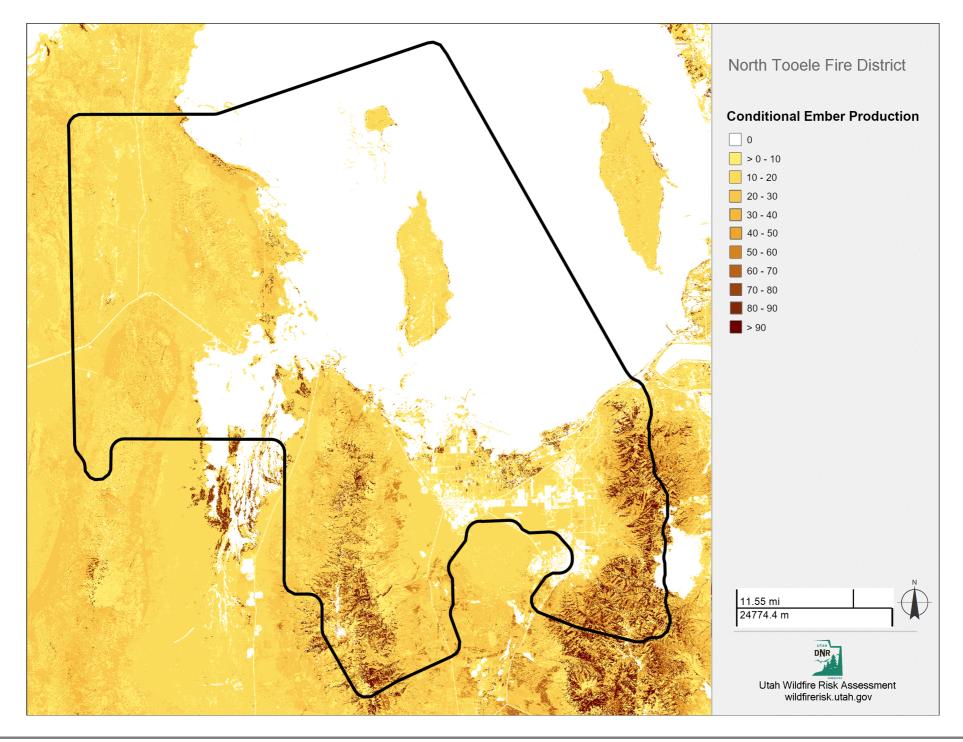


#### **Conditional Ember Production**

This dataset indicates where embers are originating when fires occur (so they could be targeted for treatment).

Conditional Ember Production Category	Acres	Percent
0	381,001	44.4 %
> 0 - 10	75,482	8.8 %
10 - 20	247,908	28.9 %
20 - 30	95,118	11.1 %
30 - 40	11,549	1.3 %
40 - 50	5,734	0.7 %
50 - 60	7,960	0.9 %
60 - 70	5,053	0.6 %
70 - 80	2,746	0.3 %
80 - 90	5,458	0.6 %
> 90	19,723	2.3 %
Total	857,732	100.0 %

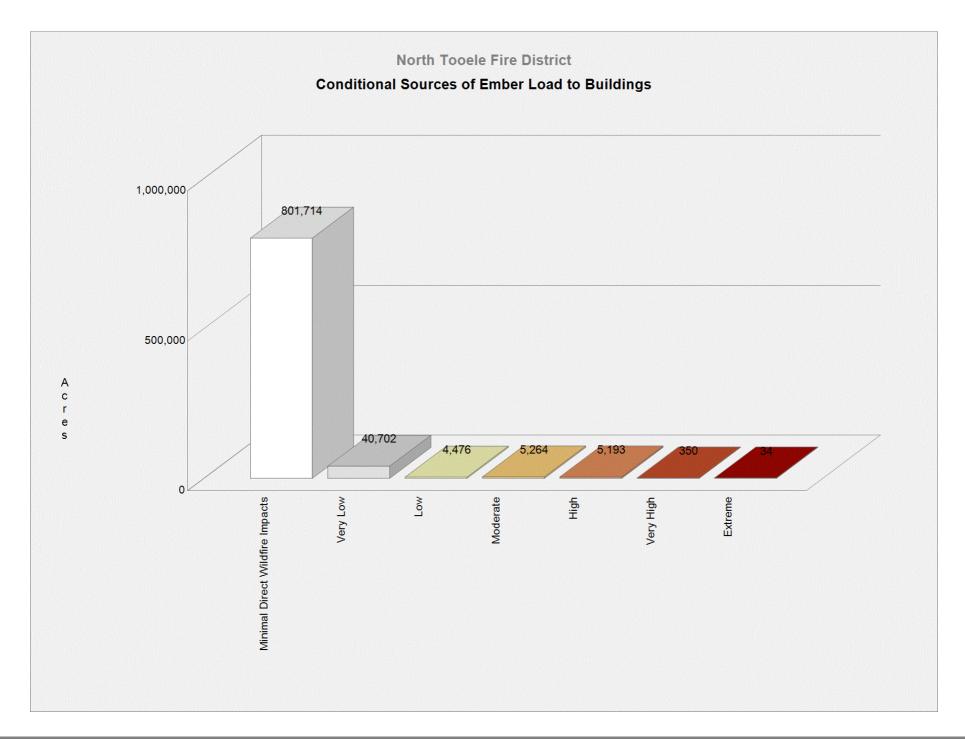


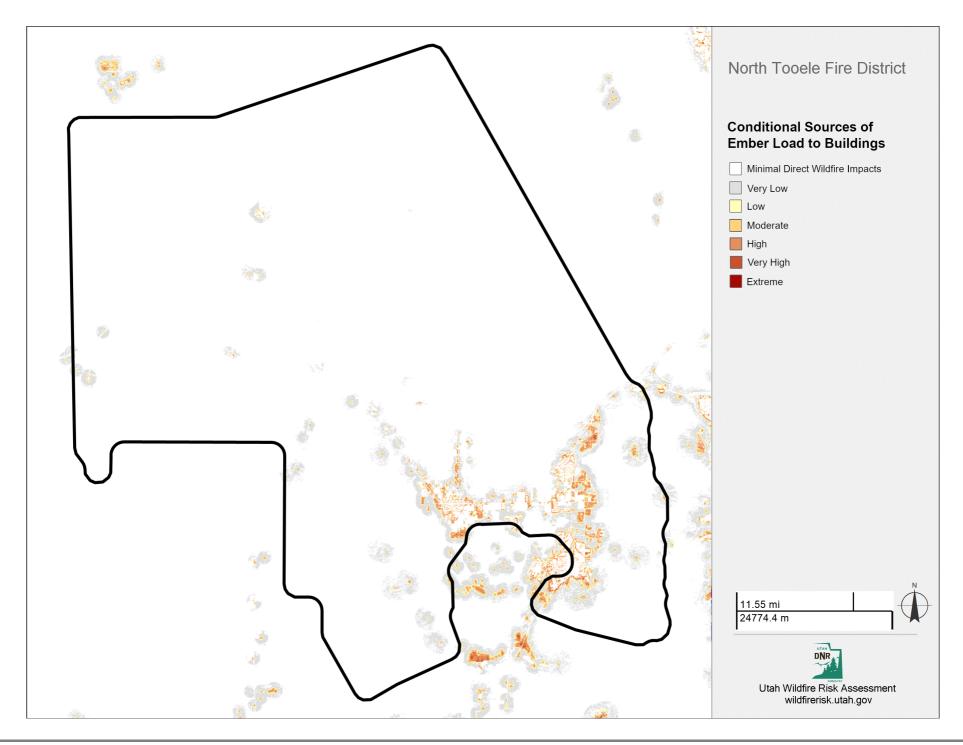


## **Conditional Sources of Ember Load to Buildings**

This dataset indicates where embers might land near buildings.

Conditional Sources of Ember Load to Buildings Category	Acres	Percent
Minimal Direct Wildfire Impacts	801,714	93.5 %
Very Low	40,702	4.7 %
Low	4,476	0.5 %
Moderate	5,264	0.6 %
High	5,193	0.6 %
Very High	350	0.0 %
Extreme	34	0.0 %
Total	857,733	100.0 %





#### **Housing-Unit Density (HUDEN)**

This dataset is the Housing-Unit Density (HUDEN) raster for the United States. HUDEN is a nationwide raster of housing-unit density measured in housing units per square kilometer. It reflects 2018 estimates of housing unit and population counts from the U.S. Census Bureau, combined with building footprint data from Microsoft (version 1.1), LandScan where building footprint data were unavailable, and land cover data from LANDFIRE.

Housing-Unit Density (HUDEN) Category	Acres	Percent
No Housing Units	834,376	97.3 %
Below Density Rating	3,120	0.4 %
Very Low	2,355	0.3 %
Low	3,114	0.4 %
Medium	3,203	0.4 %
Medium-High	3,766	0.4 %
High	5,884	0.7 %
Very High	1,915	0.2 %
Total	857,733	100.0 %

