



WILDFIRE MITIGATION PLAN/POLICY

1. EXECUTIVE SUMMARY

It is the intent of Mason County PUD No. 1 (PUD or District) to set basic guidelines for reacting to climate change and the impact that drought and severe weather patterns are having on the vegetation in our environment. It is also our intent to enact safety precautions to help reduce the risk of fire through electrical contact. This policy addresses ways that the District can be proactive in its operations and respond to emergency situations with regard to wildfires.

2. WILDFIRE MITIGATION PLAN OBJECTIVES

2.1 PURPOSE

The Wildfire Mitigation Plan (WMP or Plan) details the actions that the District is currently performing to prevent and mitigate wildfire ignition in its service territory which pose a risk to our services and community. The Plan assesses the PUD's service territory, topography, weather, infrastructure, and grid configuration to identify areas most prone to wildfire risks. The Plan provides strategies to mitigate the threat of electrical equipment ignited wildfires owned by the PUD.

2.2 SERVICE TERRITORY ASSET OVERVIEW

The District owns and operates approximately 11 miles of transmission, 120 miles of overhead distribution, and 140 miles of underground distribution circuits, including four substations in Mason and Jefferson Counties. The service territory is heavily treed and generally has very rocky soil.

3. WILDFIRE RISK

3.1 THE DISTRICT'S FIRE ENVIRONMENT

Over the next several decades the effects of climate change are projected to increase in Washington State. Summers are projected to be drier and warmer, and extreme weather events may become more likely. These conditions exacerbate the risks of wildfire ignition and spread. Changing weather patterns can shift tree pests and disease as well, causing additional fire load in forests and in the adjacent wildland urban interface (WUI).

3.1.1 HISTORICAL WILDFIRE ACTIVITY IN SERVICE TERRITORY

Large fires have been relatively few compared to east of the Cascades. Per the Wildfire History Map (Attachment A), there have been a few larger wildfires near the PUD's service territory. The Haven Lake fire, reportedly started in August of 2014 was the closest to the District's territory. None of these fires were started by or caused damage to the PUD's infrastructure.

3.1.2 WILDLAND URBAN INTERFACE (WUI)

The WUI is the zone of transition between unoccupied land and human development. It is the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Communities adjacent to and surrounded by wildland are at varying degrees of risk from wildfire.

The Washington State Department of Natural Resources (WDNR) has identified the WUI areas in District's service territory, per Attachment B.

3.2 PUD RISK ASSESSMENT

3.2.1 WILDFIRE IGNITION AND PROPAGATION

The PUD has identified risk drivers which could hypothetically result in a wildfire. In general, one or all of these risk drivers could potentially cause electrical energy to be released as heat. Resulting in a fire ignition as the heat reaches a combustible fuel. Such as, vegetation encountering a circuit or a spark landing in dry grass. Wildfire propagation results as a fire spreads to more fuels and becomes self-sustaining. The continued growth or exacerbation of the hypothetical fire is dependent on factors such as availability, type and dryness of the fuel; wind; and terrain.

3.2.1.1 Risk Drivers

These following are the most likely risk drivers associated with the PUD's infrastructure in relation to its unique geographical service territory.

3.2.1.1.1 Contact with Powerlines

Contact with powerlines by animals or vegetation.

3.2.1.1.2 Equipment Failure

Equipment failure of transformers, conductor, blown fuses.

3.2.1.1.2.1 Conductors

Small copper conductor has been identified as the largest equipment-caused risk factor. This is due to very low strength ratings and its susceptibility for brittleness.

3.2.1.1.3 Wire to Wire Contact

Wire to wire contact can occur by excessive winds and falling or excessive vegetation growth.

3.2.1.1.4 Downed Wire

Overhead wire can be brought down by trees or via poles brought down by impacts by cars.

3.2.1.1.5 Inadvertent damage

Inadvertent damage to PUD infrastructure by vandalism, or human error via contractor or PUD.

3.2.1.2 Wildfire Hazard Potential

All of the District's transmission and distributions systems all fall under very low or low wildfire hazard potential (WHP) zones. The WHP is an index that quantifies the relative potential for wildfire that may be difficult to control, used as a measure to help prioritize where fuel treatments may be needed. Treatments such as enhanced tree trimming and heightened inspection protocols. See Attachment C for maps of the distribution system's WHP and Attachment D for maps of the transmission system's WHP.

4. WILDFIRE PREVENTION AND MITIGATION PLAN ELEMENTS

The District's priority is to provide safe, reliable, and valued utility services. Many of the Plan's elements have been ongoing, but some are new. The PUD will leverage and expand on existing programs to deliver benefits for wildfire mitigation. The Plan's overall effectiveness will be evaluated and many elements new and existing will adapt over time to align with latest best practices.

4.1 ENHANCED SITUATIONAL AWARENESS

Enhanced situational awareness requires awareness of potential infrastructure shortfalls as well as continual fire-related weather monitoring.

4.1.1 ENHANCED INSPECTION TECHNOLOGY

Regular inspections as described in the District's Inspection & Maintenance Plan were designed to verify the condition of critical infrastructure, quickly assess potential hazards, and provide remedial action before critical assets can pose undue risk. In addition, the District conducts infrared (IR) thermography testing and un-manned (drone) inspections as described in the PUD's Inspection and Maintenance Plan. IR thermography testing helps to identify specific locations that are at-risk of failure. Locations that are not identifiable by the naked eye. While the intent of the un-manned aircraft (drone) inspections is to inspect facilities in the remote and rugged parts of the service territory that are difficult to reach by land.

4.1.2 FIRE WEATHER MONITORING

The District continually monitors, throughout the year weather for conditions that can pose a risk during wildfire season, such as drought. Additionally, during wildfire season, the PUD monitors real-time weather and wildfire predictive services for conditions, that may present additional wildfire risk the service territory.

- National Weather Service (NWS) Seattle: <https://www.weather.gov/sew/>
- United States Forest Service (USFS) & United States Department of Agriculture (USFS & USDA) – Burn Probability: <https://wildfirerisk.org/explore/0/53/53045/>
- Northwest Interagency Coordination Center (NWCC) Predictive Services – Fire Potential: <https://gacc.nifc.gov/nwcc/predict/index.aspx>
- InciWEB - Incident Information System: <https://inciweb.nwccg.gov/>
- Washington State Department of Natural Resources (DNR) Burn Risk Map: <https://burnportal.dnr.wa.gov/>
- ESRI - US Wildfire Map: <https://www.esri.com/en-us/disaster-response/disasters/wildfires>
- National Oceanic and Atmospheric Administration (NOAA) – Red flag warnings, Wind Speeds, Thunderstorms, etc.: <https://digital.weather.gov/?zoom=6&lat=46.394&lon=-117.92332&layers=00BFFTTFTT®ion=0&element=0&mxmz=false>

4.2 FAULT REDUCTION

The District currently employs multiple strategies to aid in the reduction of potential fire ignition. These include enhanced vegetation management practices, overhead copper wire replacement, and strategic undergrounding.

4.2.1 ENHANCED VEGETATION MANAGEMENT

The vegetation maintenance cycle can also be used to determine the risk of a vegetation related faults. The goal is to proactively maintain vegetation and update the maintenance cycles in critical areas as the plan progresses. Ensuring that vegetation does not contact electrical infrastructure minimizes the probability that District assets may be the origin or contributing factor in the ignition of a wildfire. The PUD created the vegetation management plan with wildfire prevention in mind, collaborating with the local authorities, local fire departments, and the U.S. Forest Service on an as-needed basis. The plan will be reviewed and updated on an as-needed basis or every three-years, depending on changing conditions.

4.2.2 OVERHEAD COPPER WIRE REPLACEMENT

The District has identified areas with existing overhead copper wire and has slotted them for replacement. This is an ongoing program where areas are identified and scheduled for replacement annually.

4.2.3 STRATEGIC UNDERGROUNDING

The PUD has identified multiple locations that would benefit from being converted to underground construction. These locations have been strategically prioritized. However, underground construction is very expensive, so it is not always possible to underground within our annual budget. The leadership team consistently seeks opportunities to leverage and acquire additional funds to build as much underground as possible while maintaining the PUD's affordable rates.

4.3 FAULT PROTECTION

Automatic reclosing is critical for fast and efficient restoration of service; however, in isolated cases, arcing events can ignite dry grass or vegetation during fire weather events.

4.3.1 RECLOSE BLOCKING

Reclose blocking entails configuring specific reclosers to operate in a fire protection mode rather than reliability mode. Reclose blocking prevents immediate restoration attempts and would require line crews to be dispatched to visually inspect and declare clear before re-energization. This action is impactful to the District's operating budget, due to the increased labor and outage response expenses, especially in overtime periods.

4.3.2 NON-EXPULSION FUSES

The District, like the majority of the utility industry, installs expulsion fuses for transformer and overhead line protection. When an expulsion fuse operates to isolate the section of line where the fault occurred it vents gas and molten metal to extinguish the arc created by the fault. However, the molten metal, has the potential to be an ignition source for a wildfire.

Non-expulsion fuses such as current-limiting fuses limit the amount of energy going into failed equipment and does not emit gas, sparks, or debris. This greatly reduces the potential for wildfire ignition. Current-limiting fuses are more costly than expulsion fuses but are a viable option in areas where vegetation management is difficult to maintain, exceptionally dry areas, and or areas found have higher wildfire potentials in the future.

4.4 OPERATIONAL PROCEDURES AND EMERGENCY RESPONSE

4.4.1 CONCEPT OF OPERATIONS

Operational practices encompass standard company procedures that relate to wildfires, including vegetation management, inspection, and maintenance, and in extreme cases and in coordination with Bonneville Power Administration, Mason County Emergency Management, and other public safety agencies.

4.4.1.1 Notification

Communication is critical in emergency situations. The PUD will communicate via phone and email to delegated points of contacts for each corresponding agency- i.e.: Mason County, Jefferson County, BPA, etc. and also use social media and local news media outlets to convey important information.

4.4.1.2 Response Priorities

In the event of a wildfire incident, the District's priorities are as follows:

- Safety of personnel and communities
- Stabilization of infrastructure
- Preservation of property

4.4.1.3 Situational Awareness

The PUD monitors monitoring weather-related information on a daily basis throughout the year, including weather information related to wildfire risk. When the risk falls within prescribed activation thresholds the operational focus will shift from reliability to fire prevention. Exact steps depend on the level of fire threat.

4.4.1.3.1 Activation Thresholds

Fire Danger Rating and Color Code	Description
Low (L) (Green)	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but woods fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.
Moderate (M) (Blue)	Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
High (H) (Yellow)	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Very High (VH) (Orange)	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
Extreme (E) (Red)	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.

Fire-Danger Classes: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd646166.pdf

4.4.1.3.1.1 Fire Prevention Operational Actions

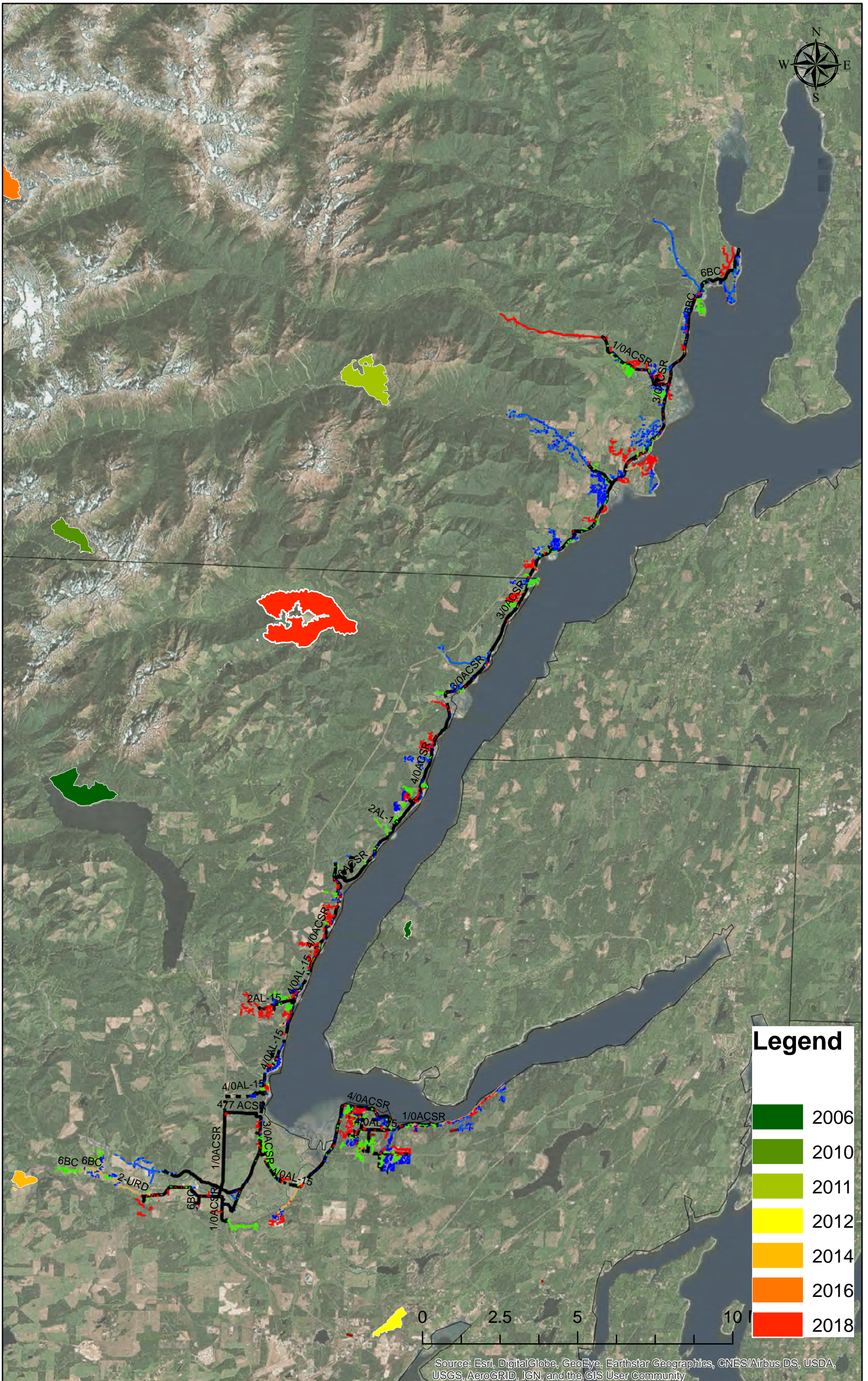
Fire Danger Rating and Operational Action	Low (L) (Green)	Moderate (M) (Blue)	High (H) (Yellow)	Very High (VH) (Orange)	Extreme (E) (Red)
Circuit Recloser Settings	Automatic Reclosing	Automatic Reclosing	Reclose Blocking	Reclose Blocking	Reclose Blocking
Patrol following circuit outage	No ¹	No ¹	Yes	Yes	Yes

¹ No patrol is required. Re-test allowed following check of fault indicators, SCADA, other system indicators, and reports from the field. If the re-test fails, a patrol is mandatory.

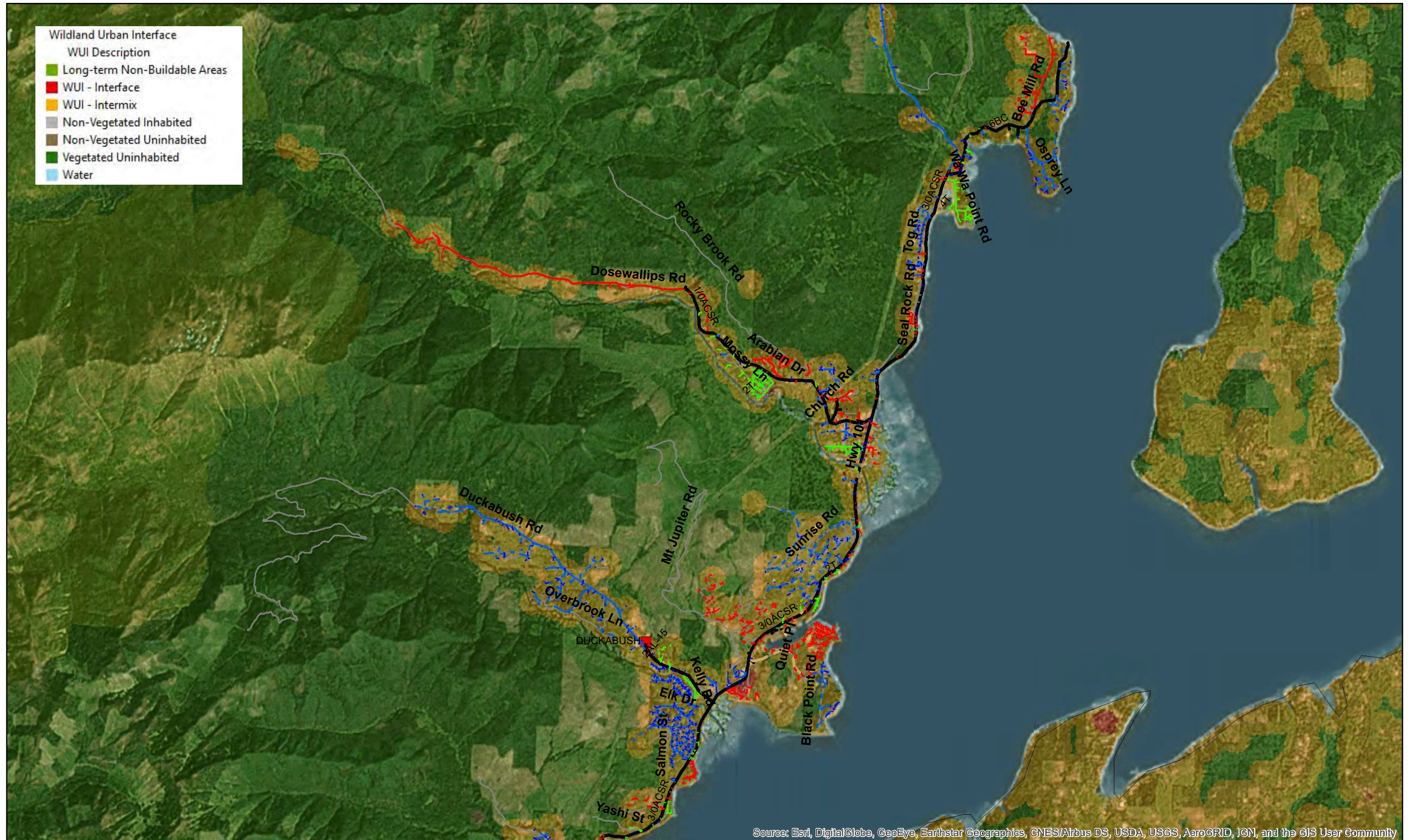
4.5 POLICY RESPONSIBILITY

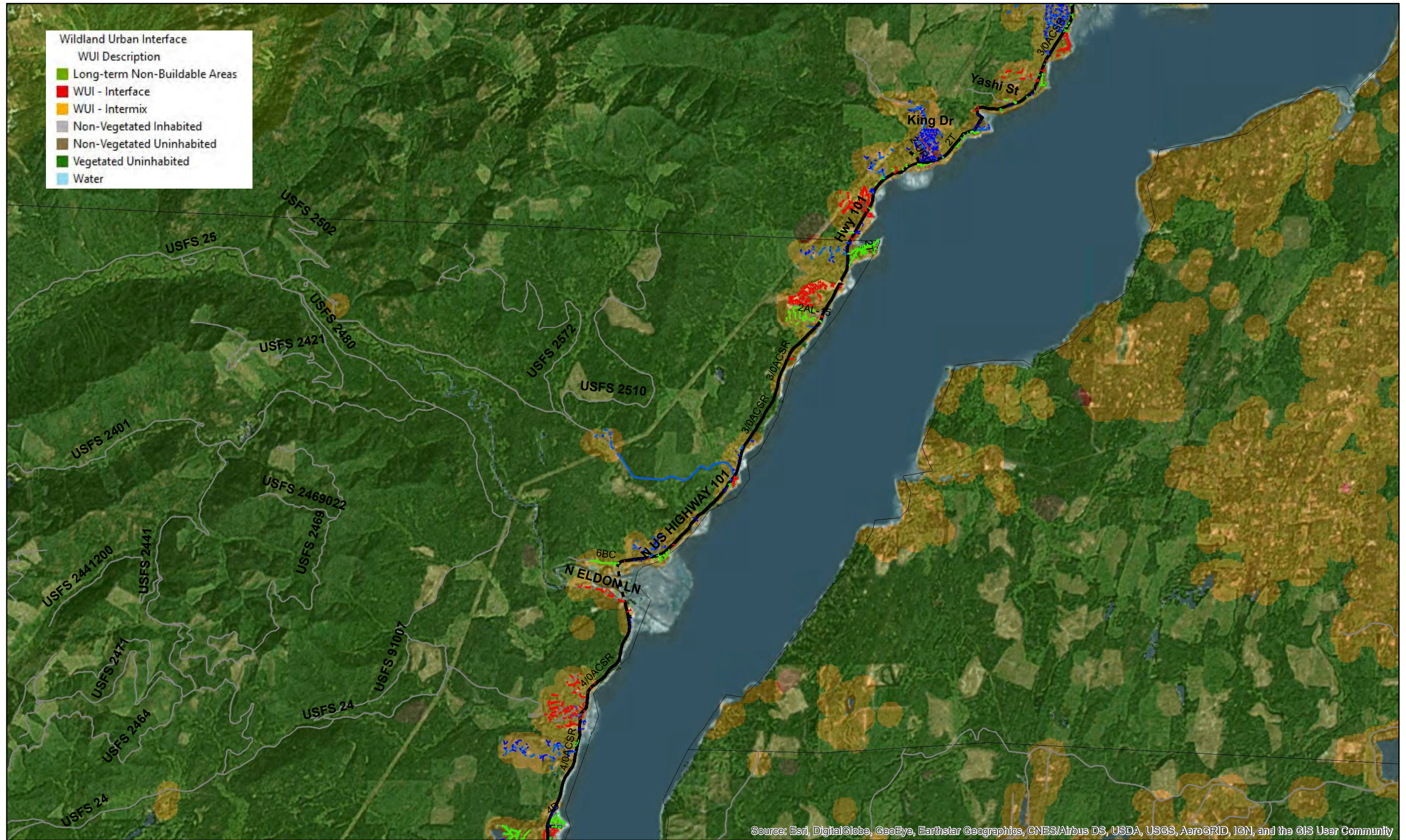
The General Manager and/or their designee is responsible for the administration of this policy.

Attachment A

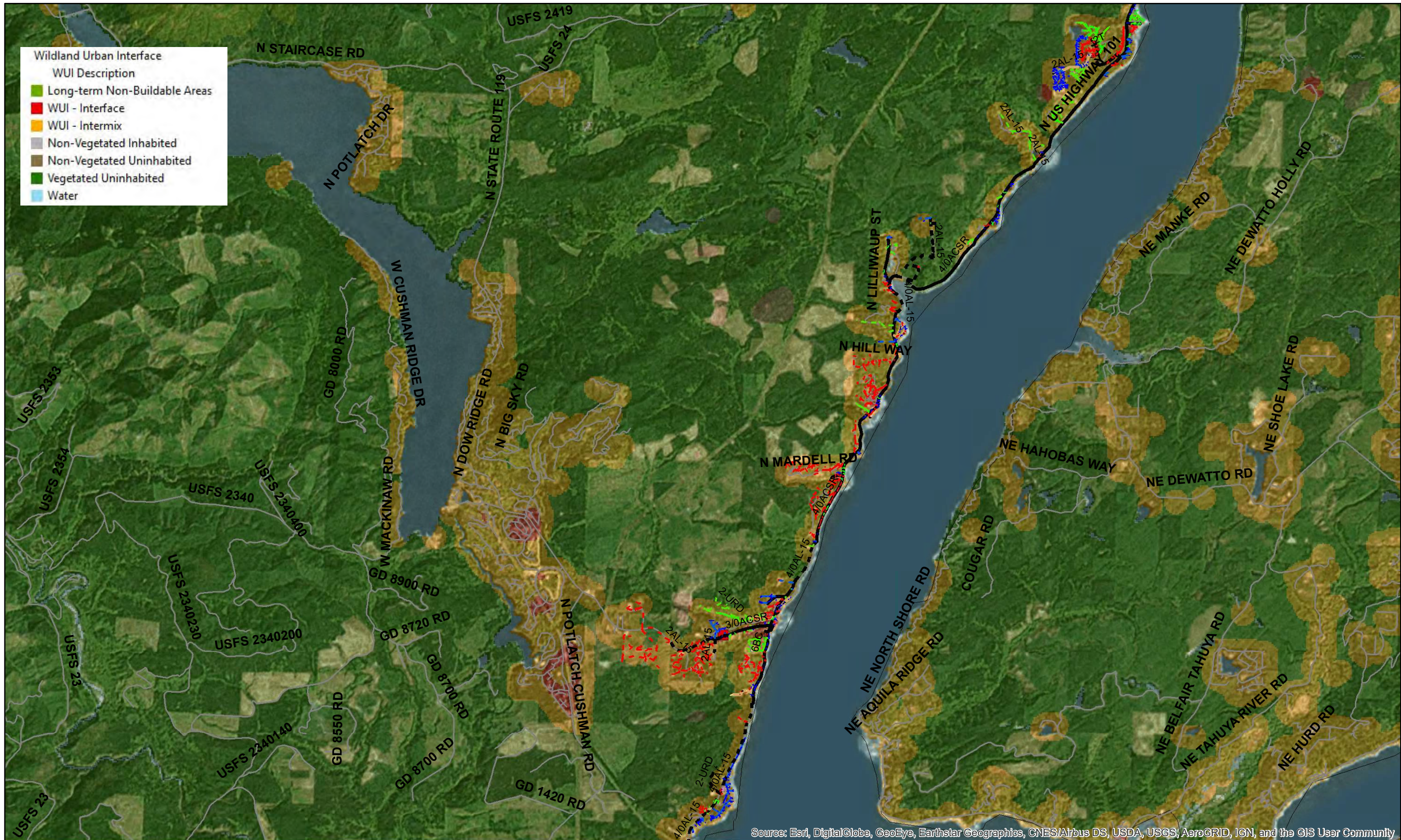


Attachment B

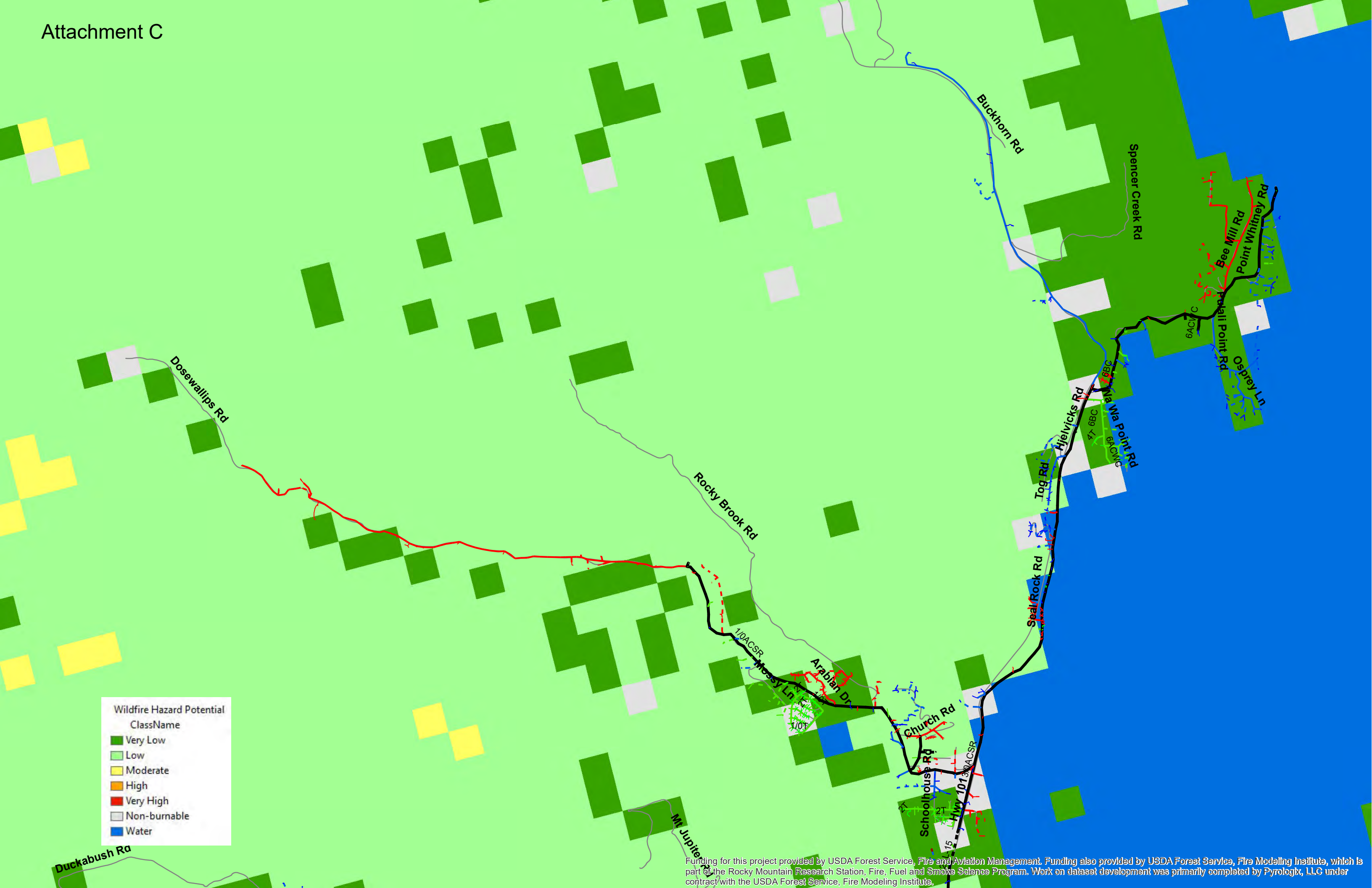


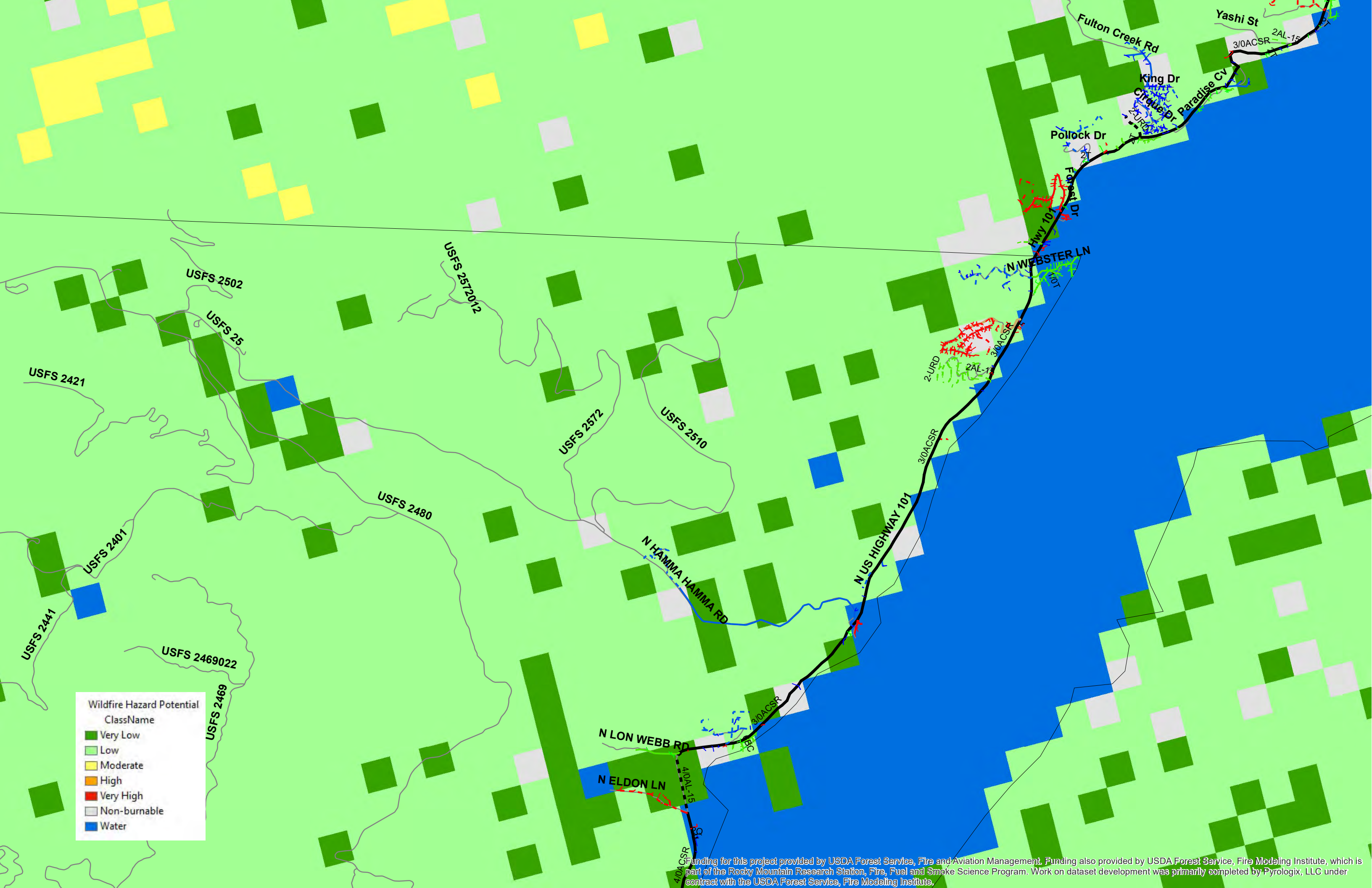


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

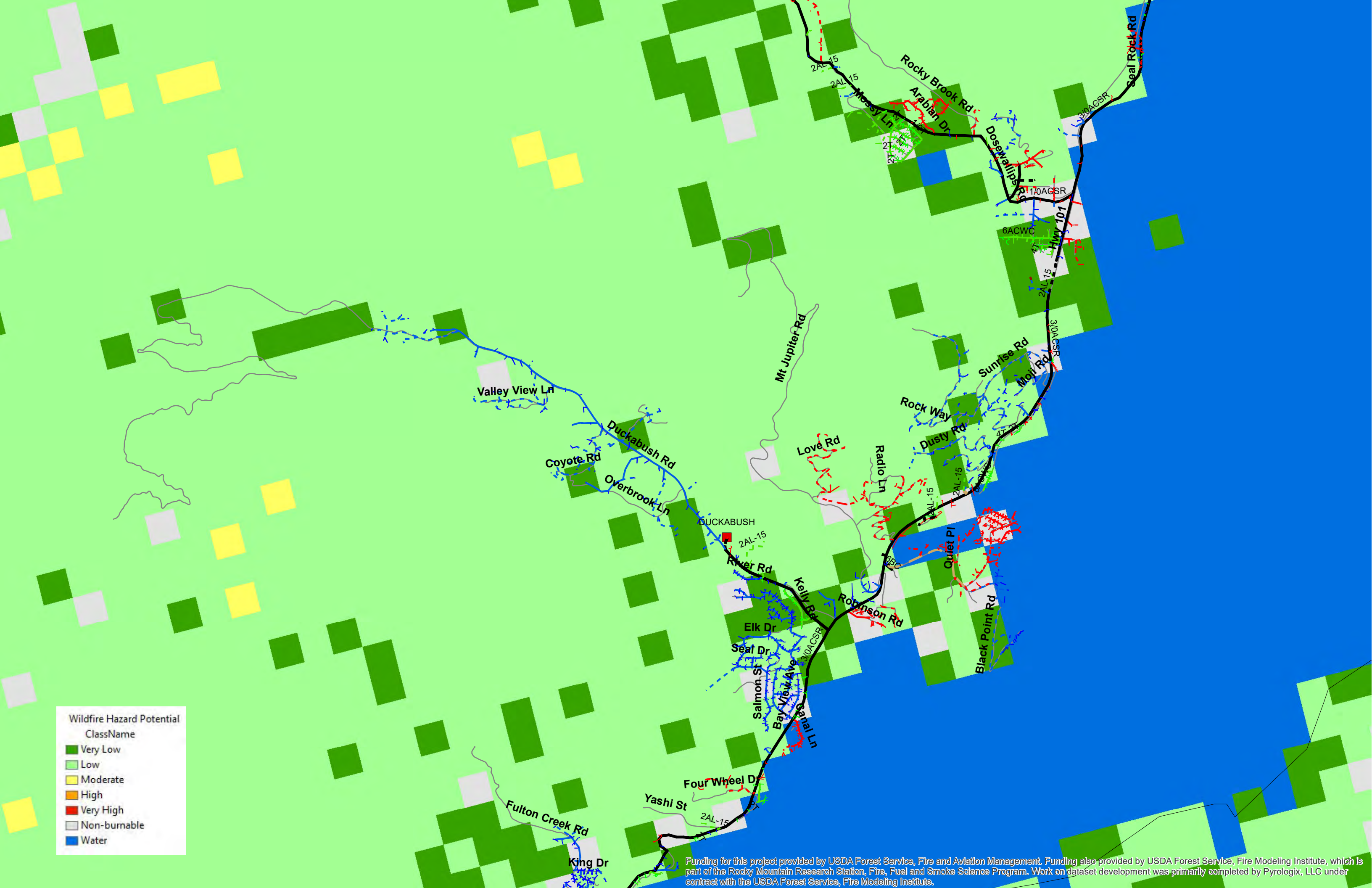


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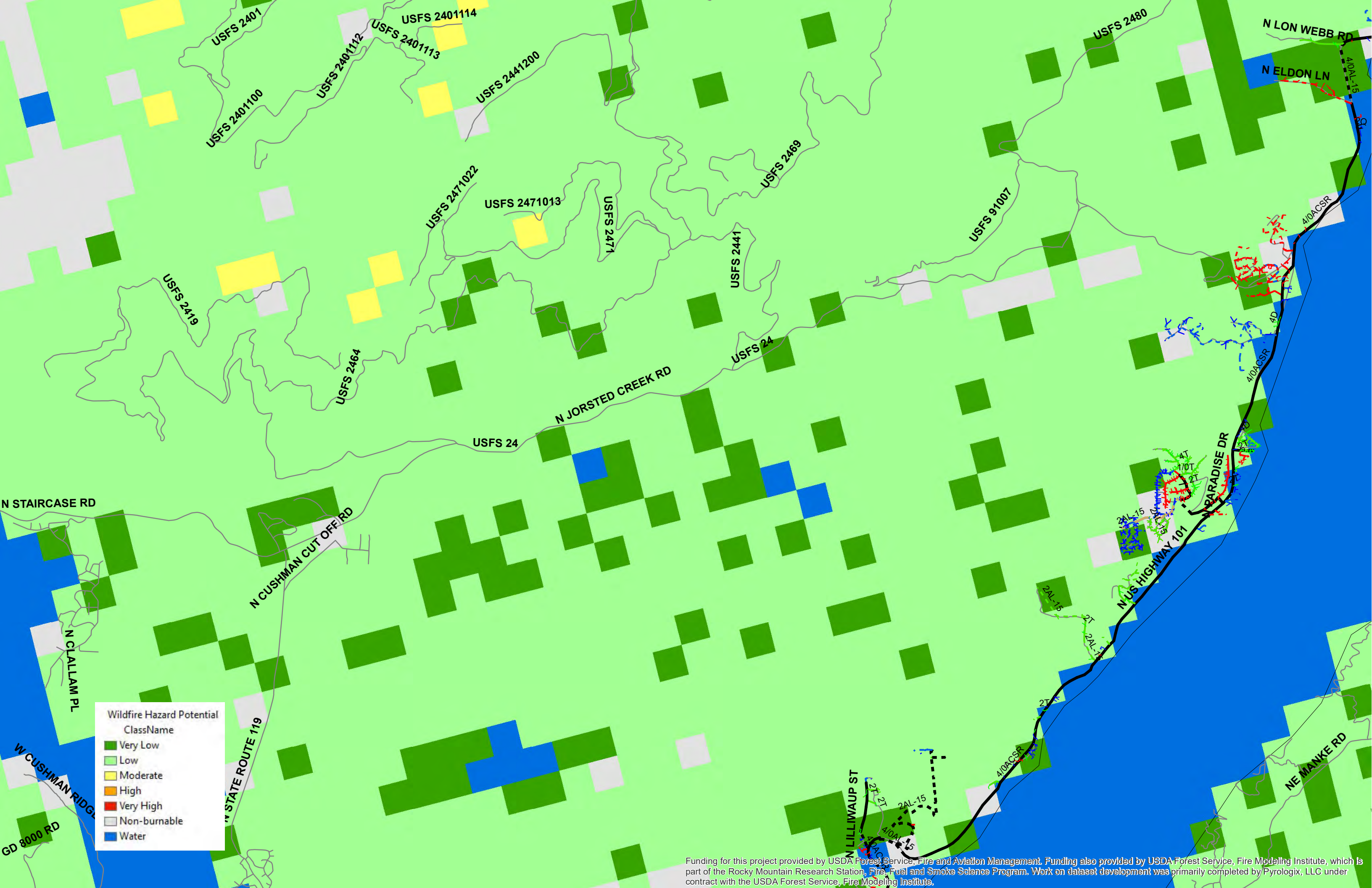




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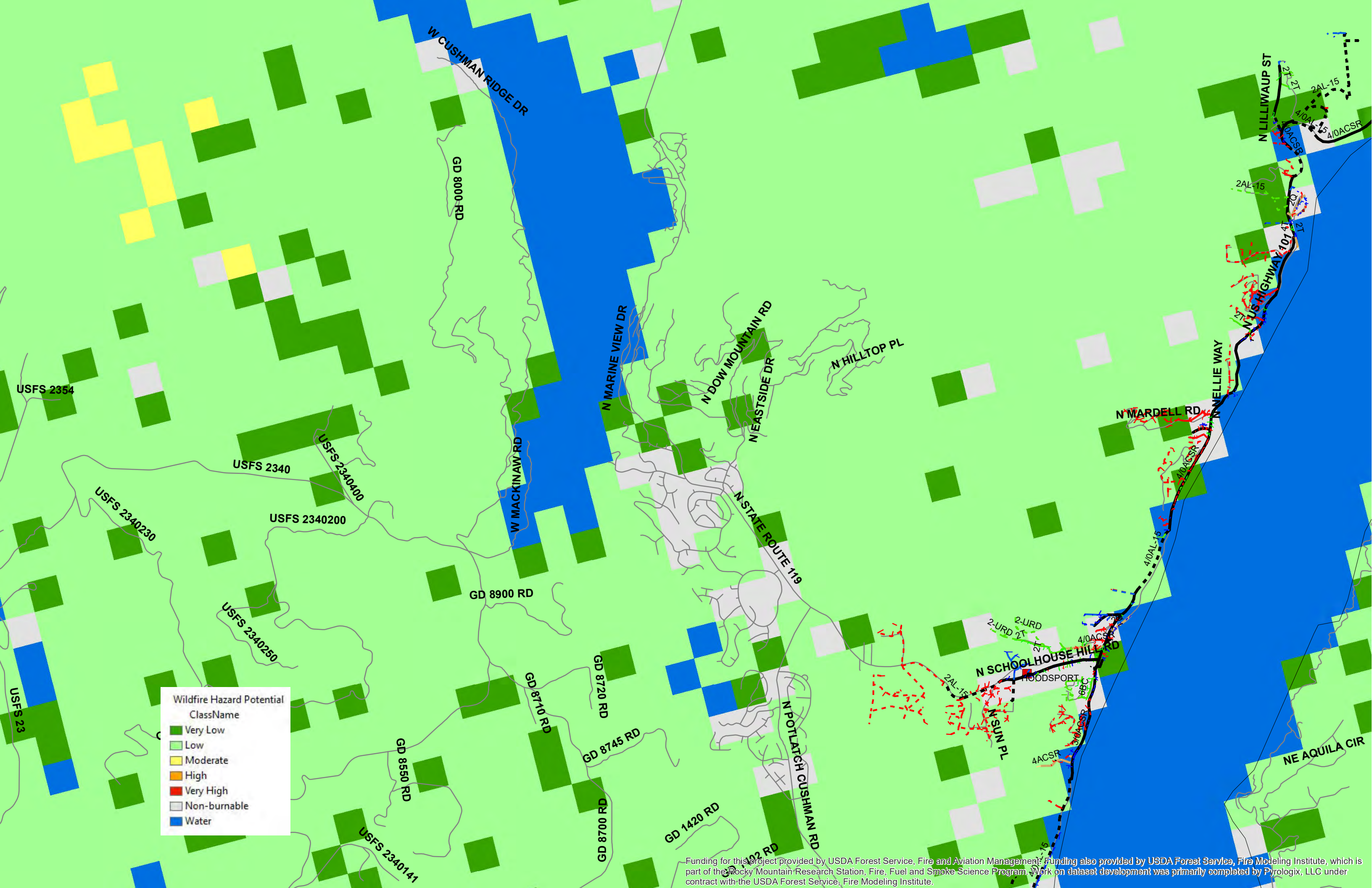
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Wildfire Hazard Potential

ClassName

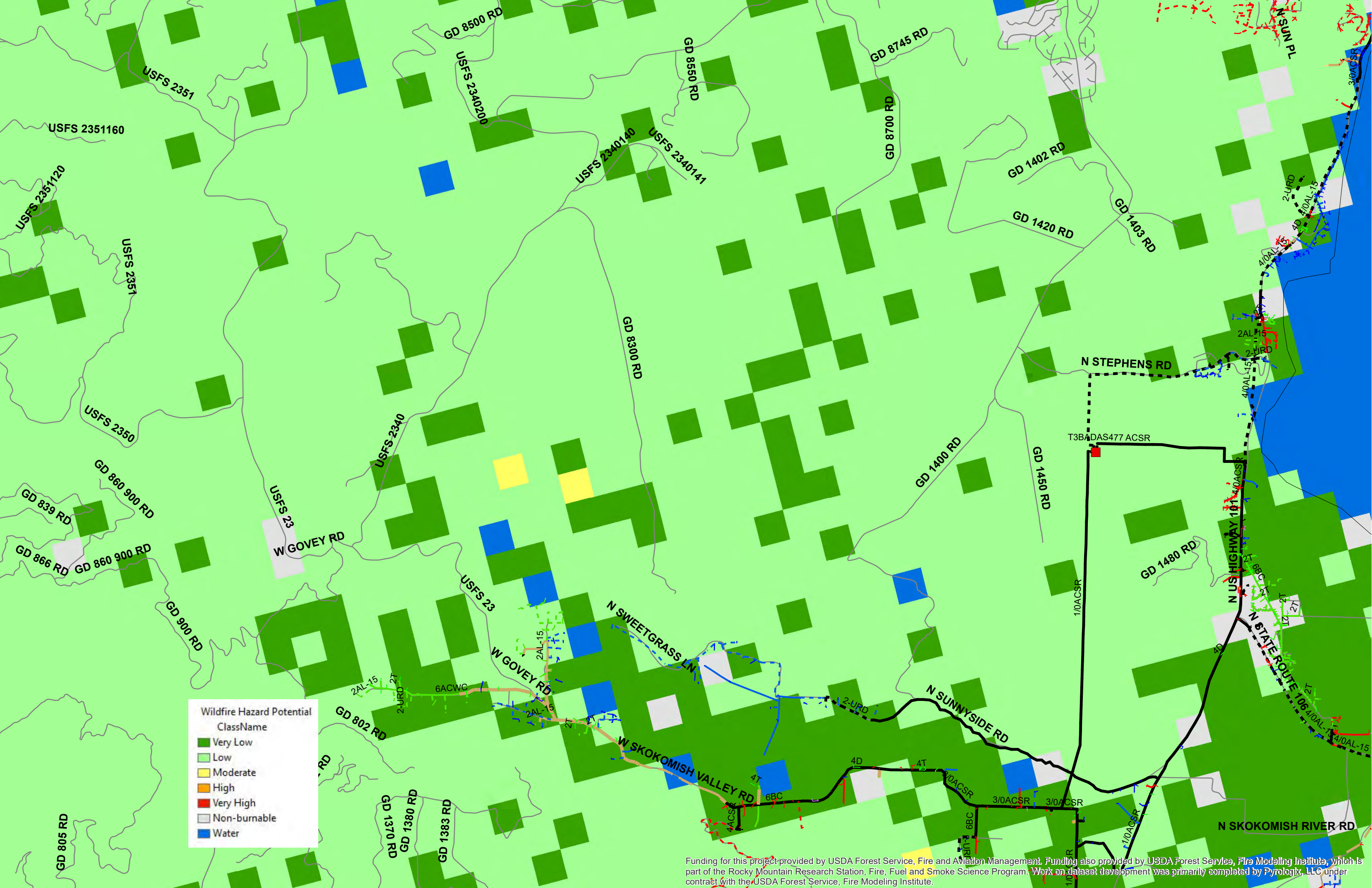
- Very Low
- Low
- Moderate
- High
- Very High
- Non-burnable
- Water



Wildfire Hazard Potential

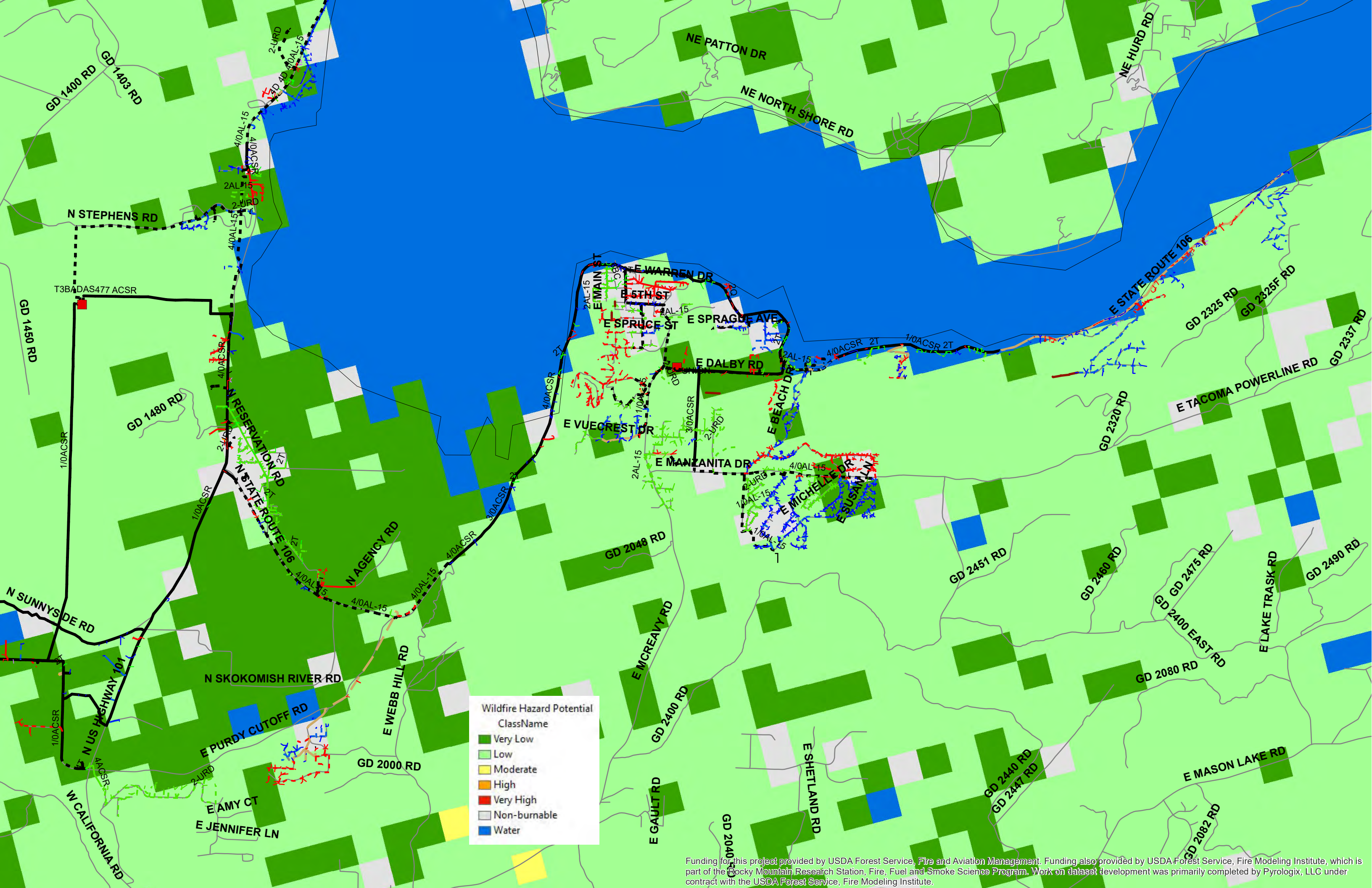
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Wildfire Hazard Potential	
ClassName	
Very Low	Dark Green
Low	Light Green
Moderate	Yellow
High	Orange
Very High	Red
Non-burnable	Light Grey
Water	Blue

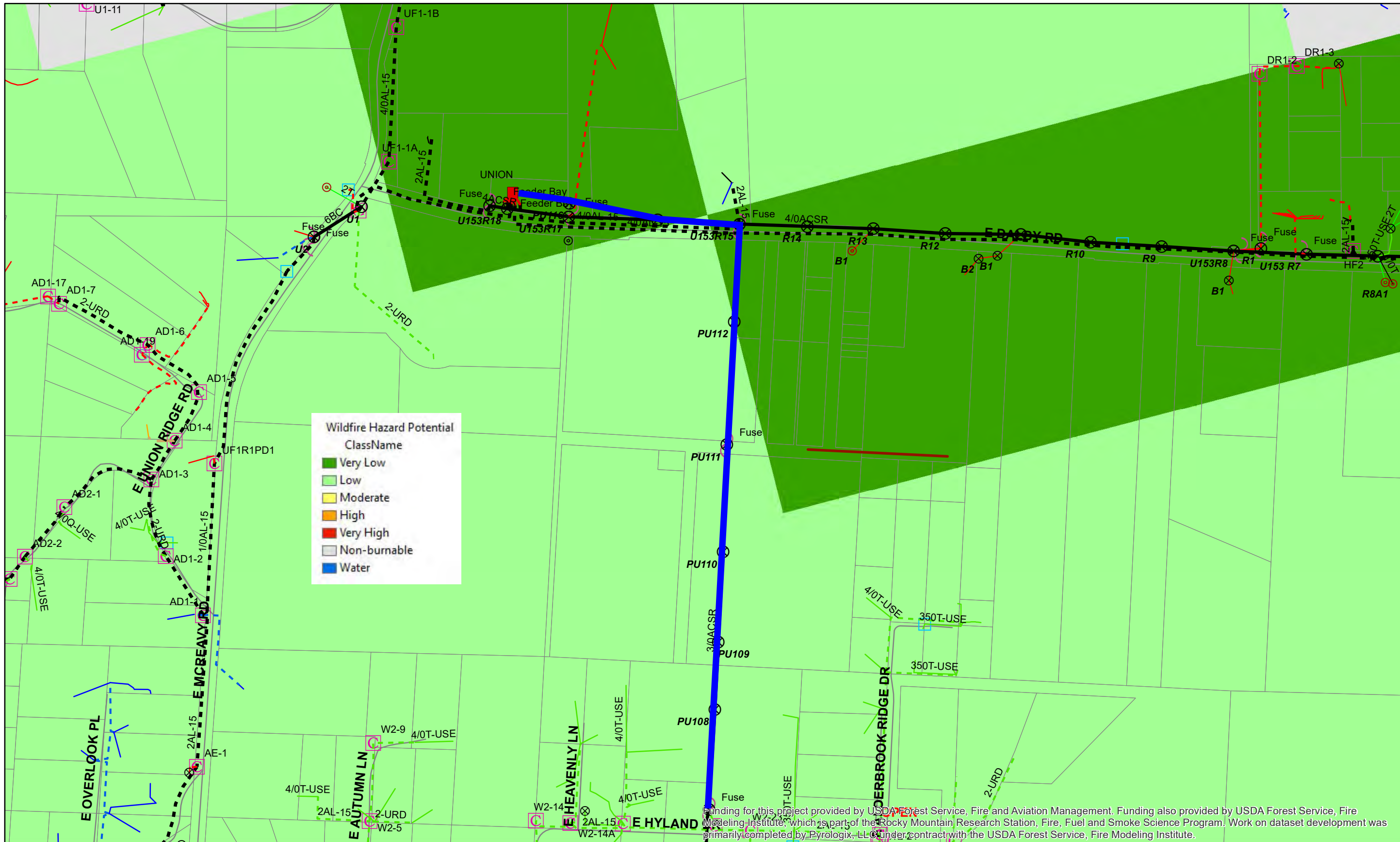
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Wildfire Hazard Potential

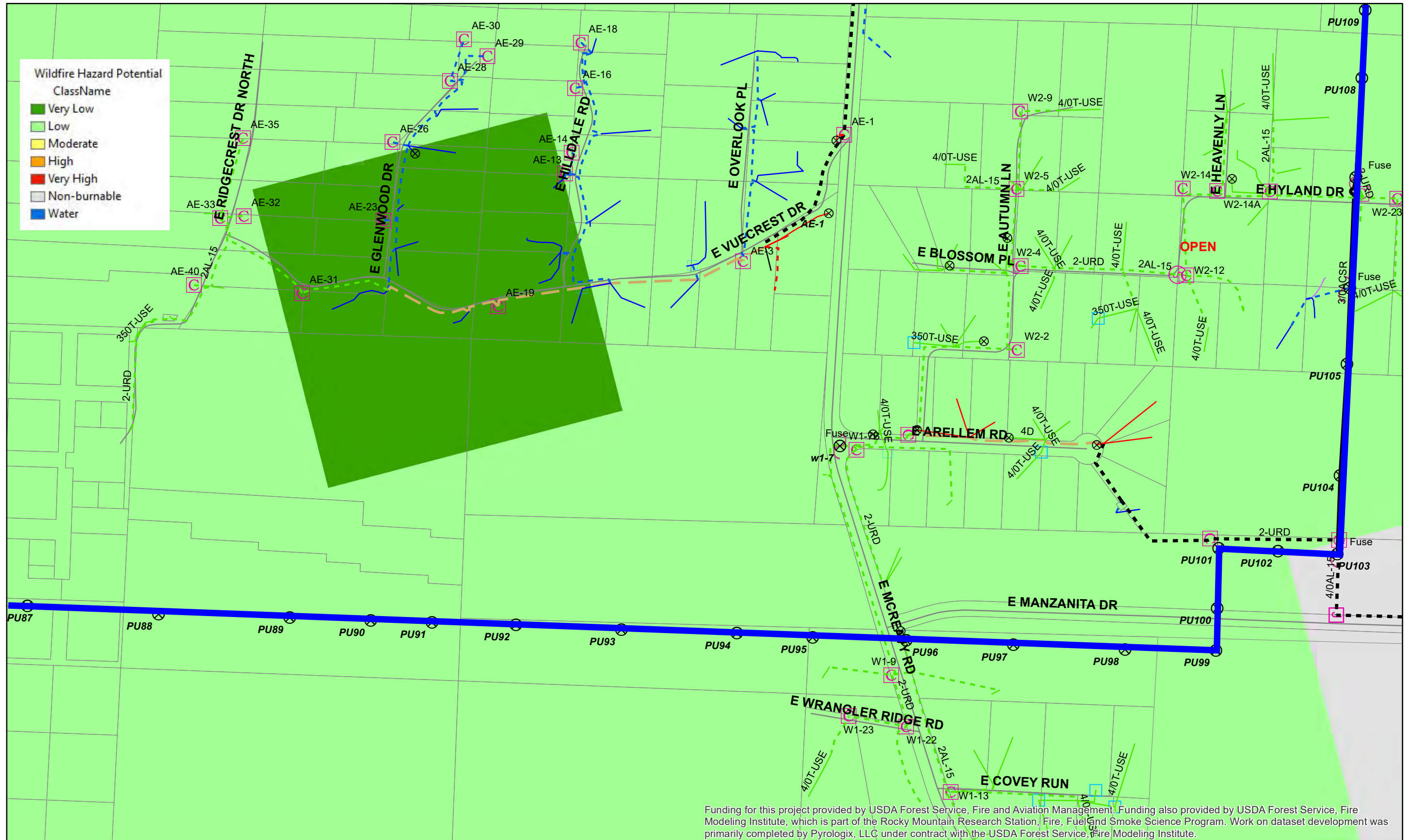
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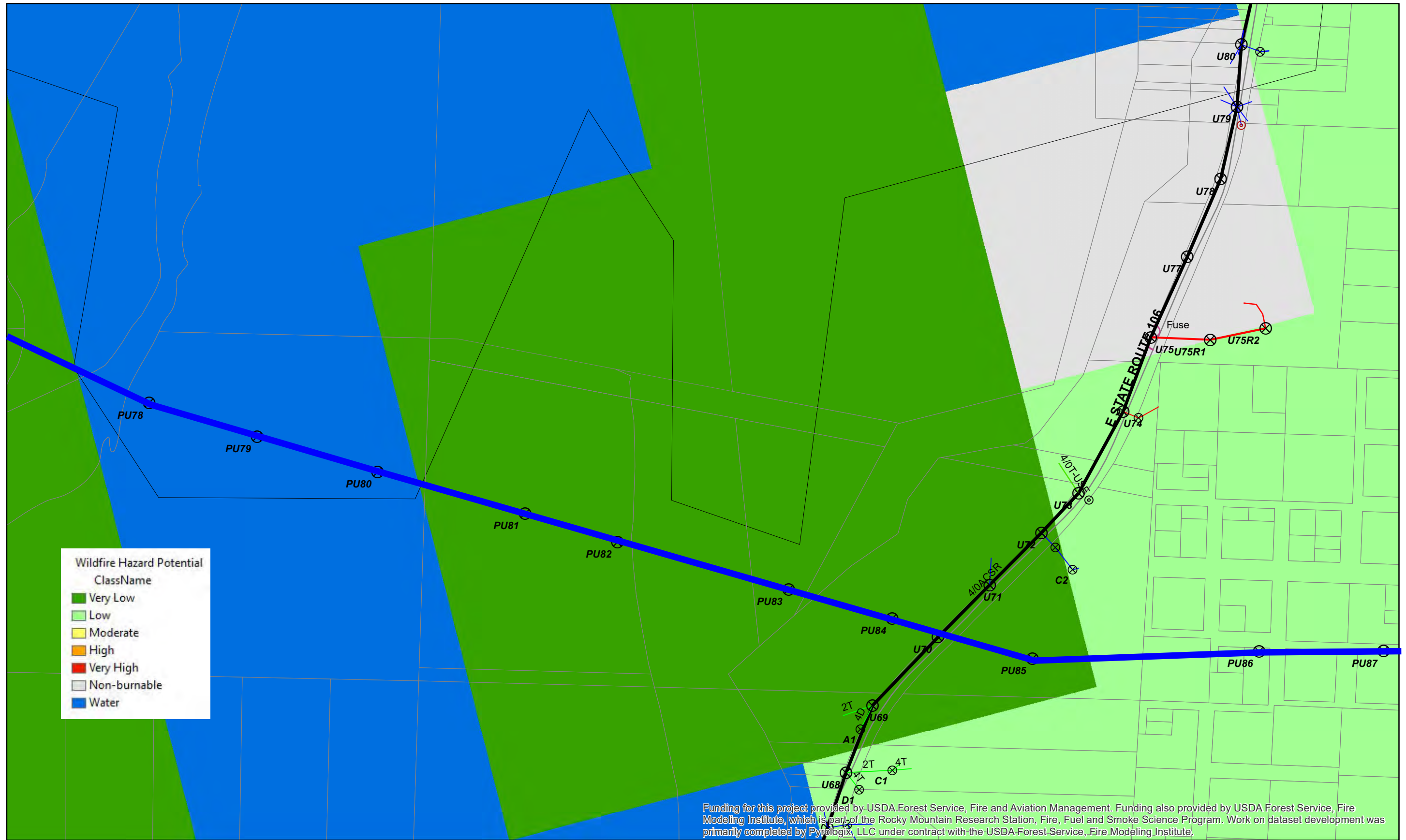


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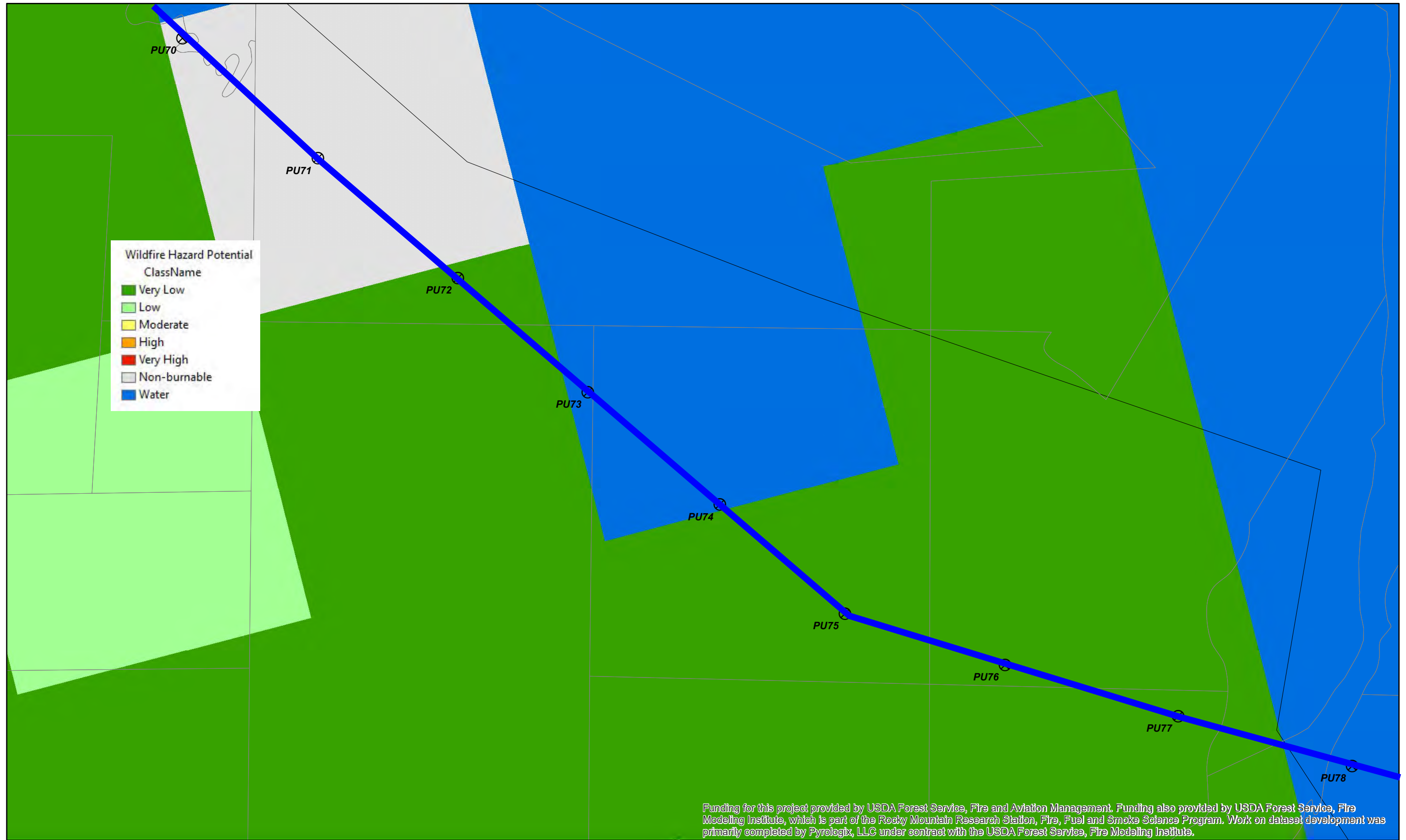
Attachment D



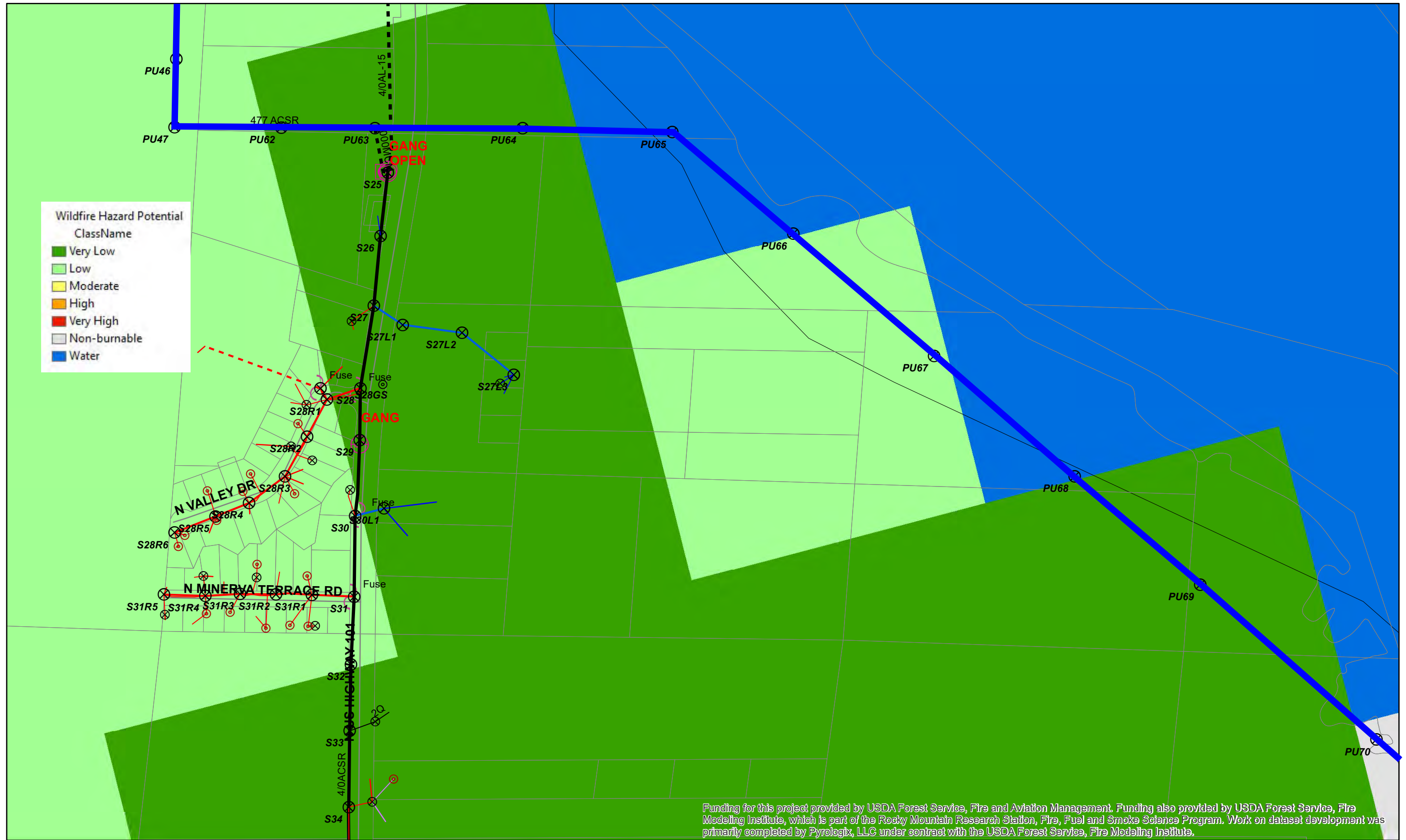
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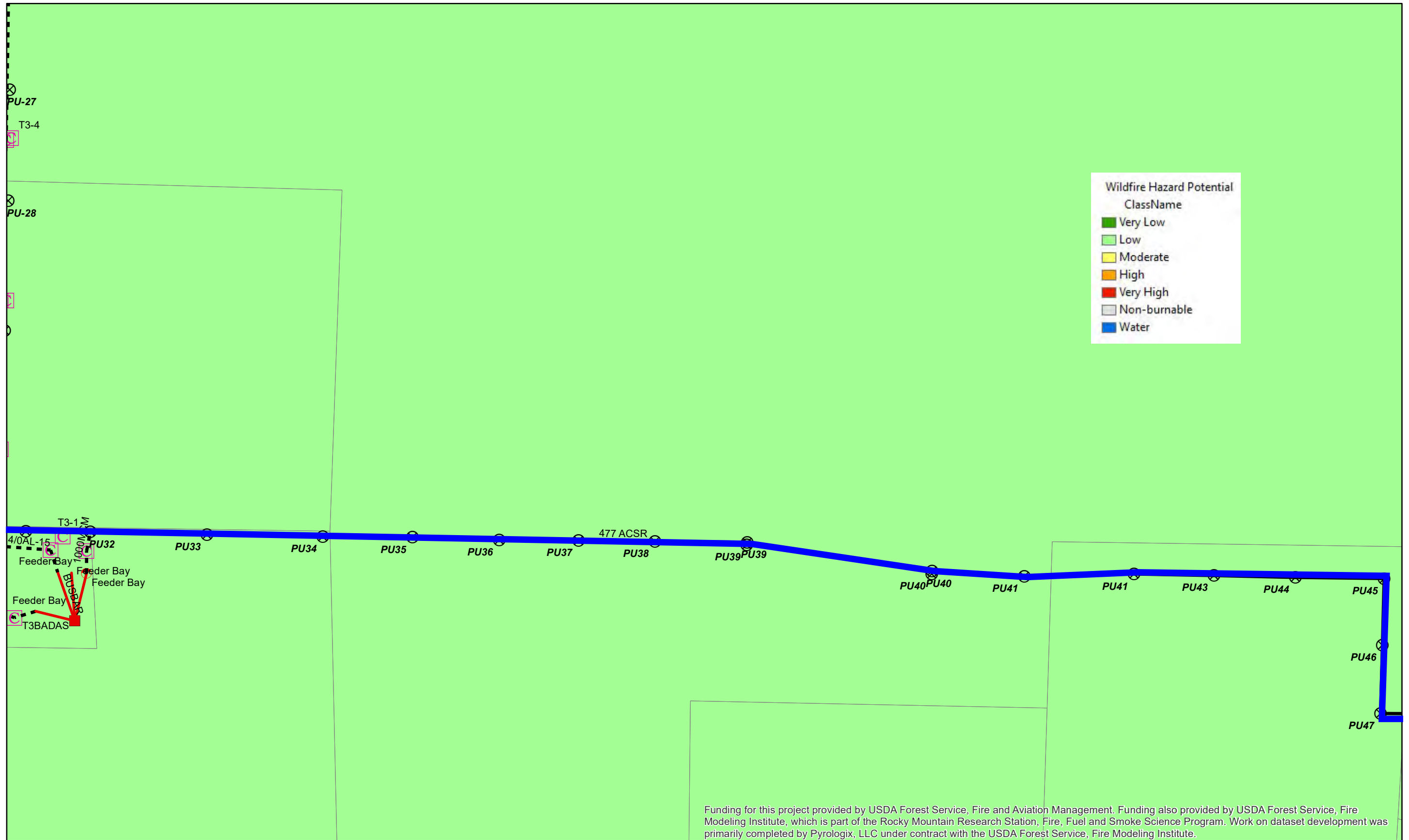
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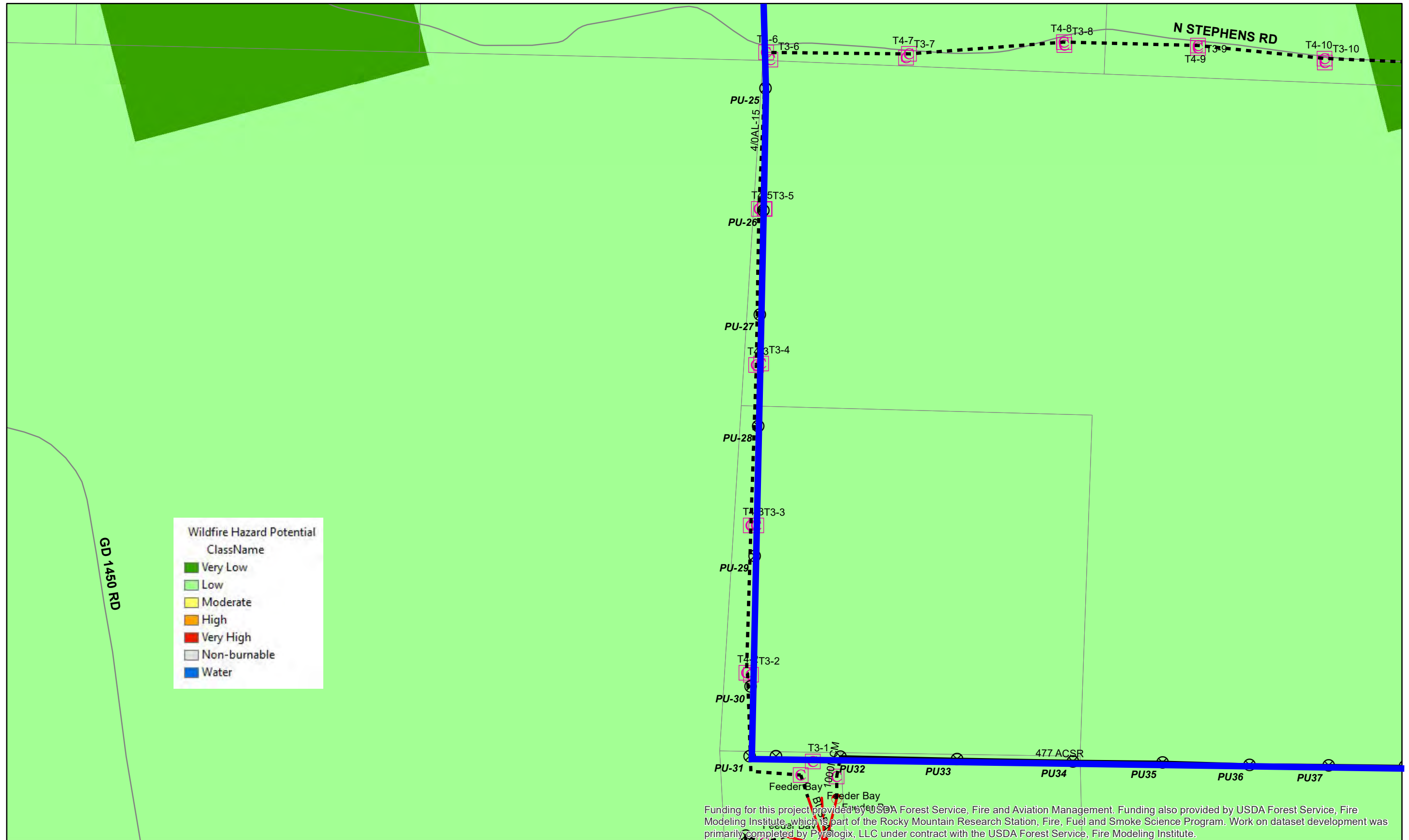
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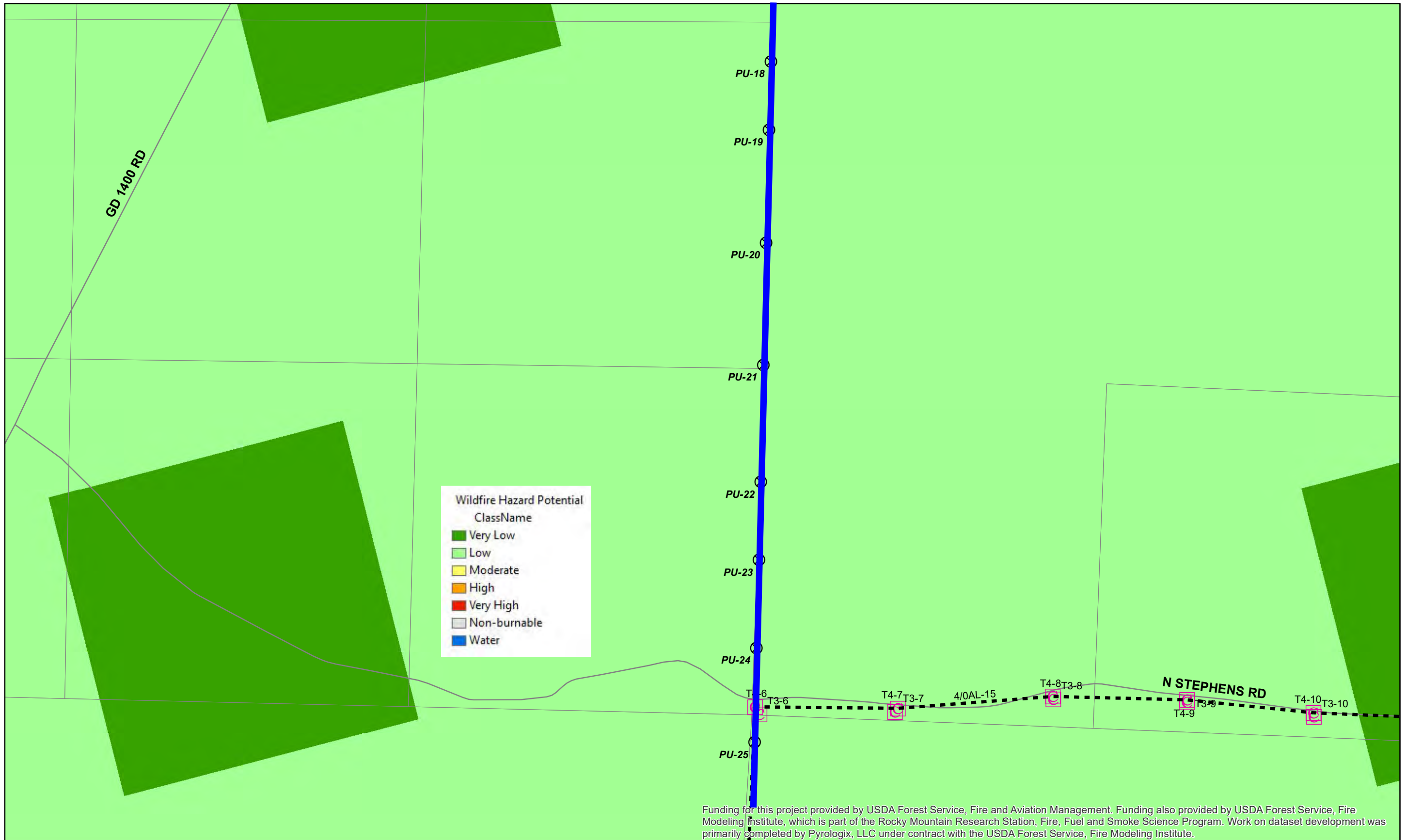
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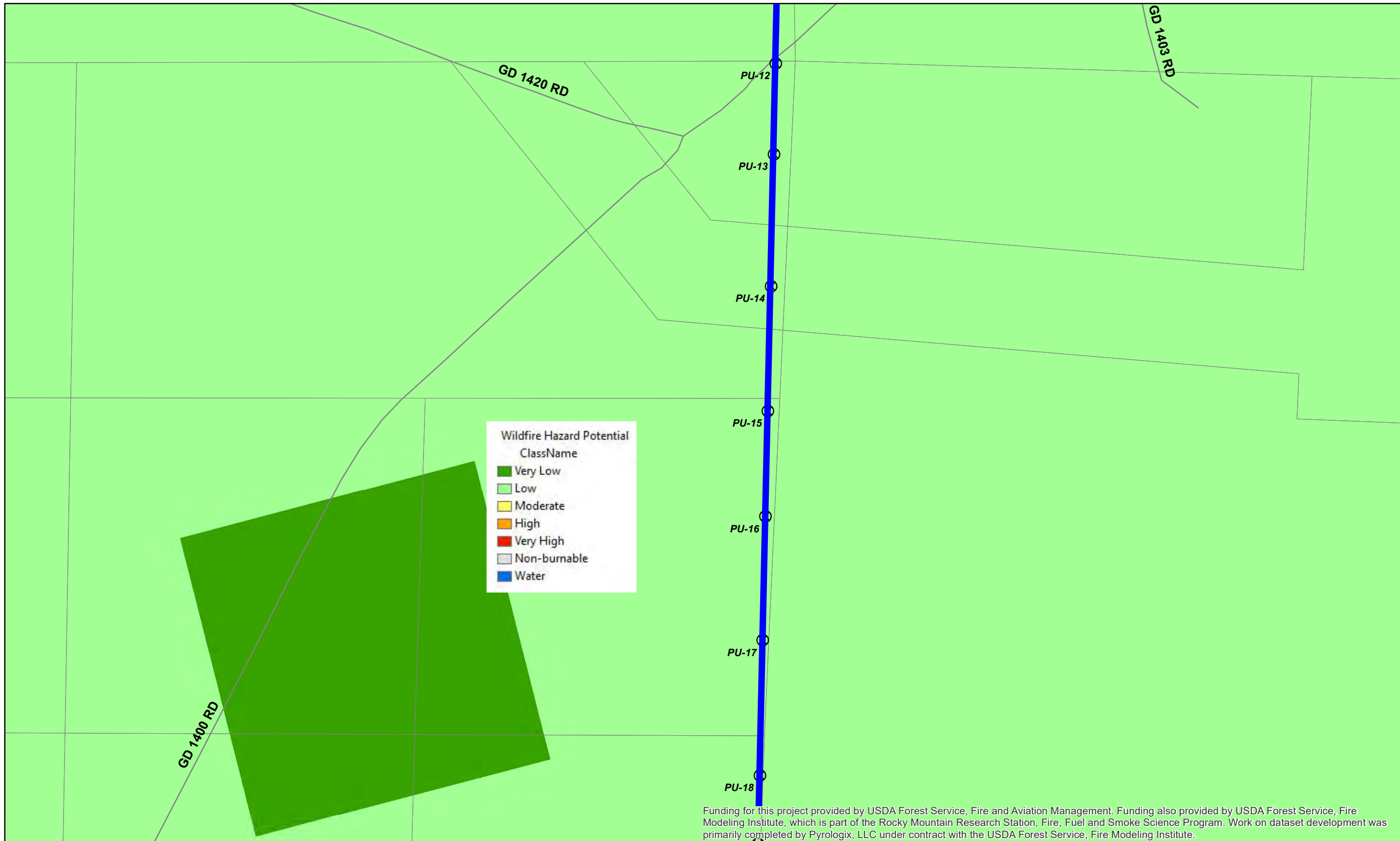
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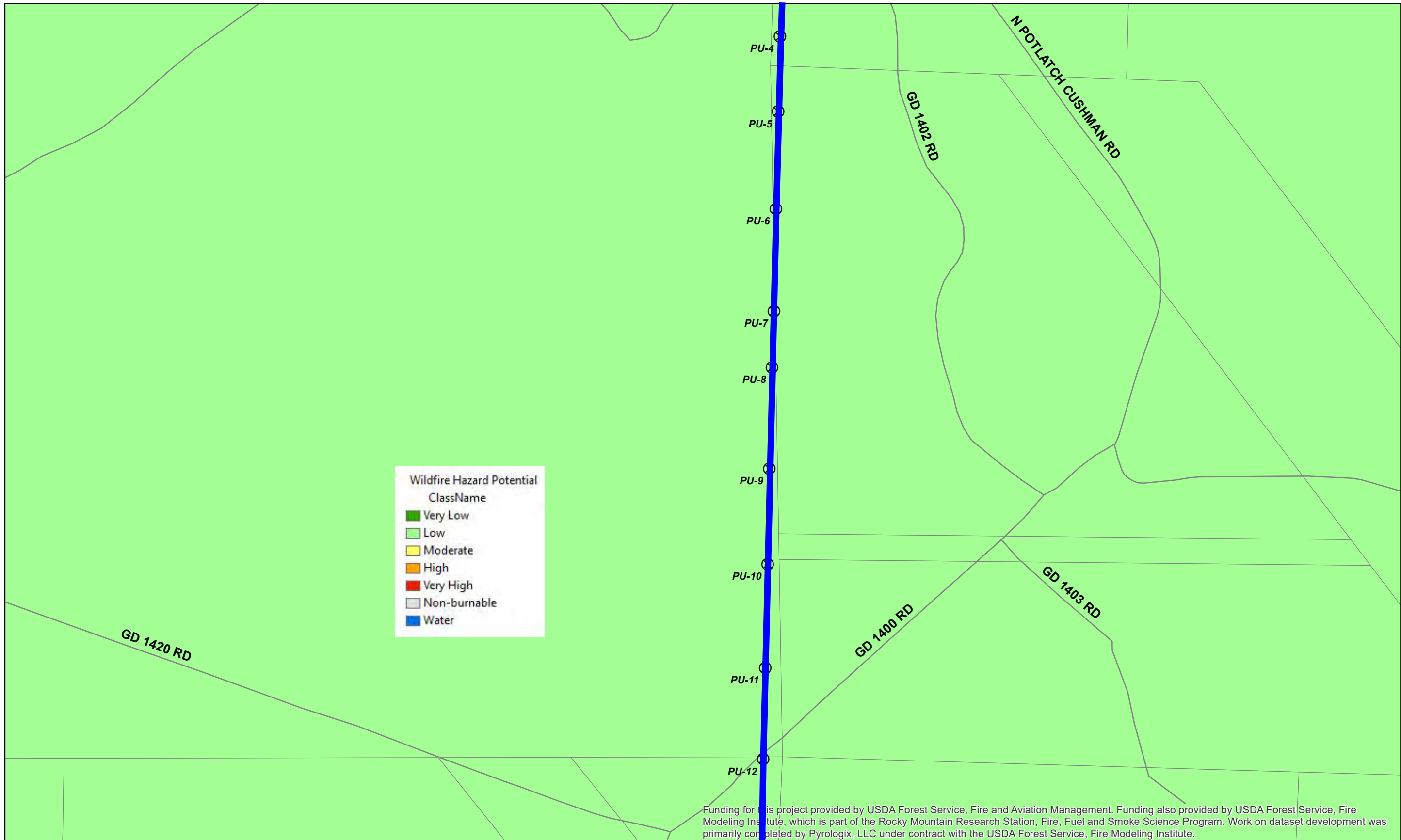
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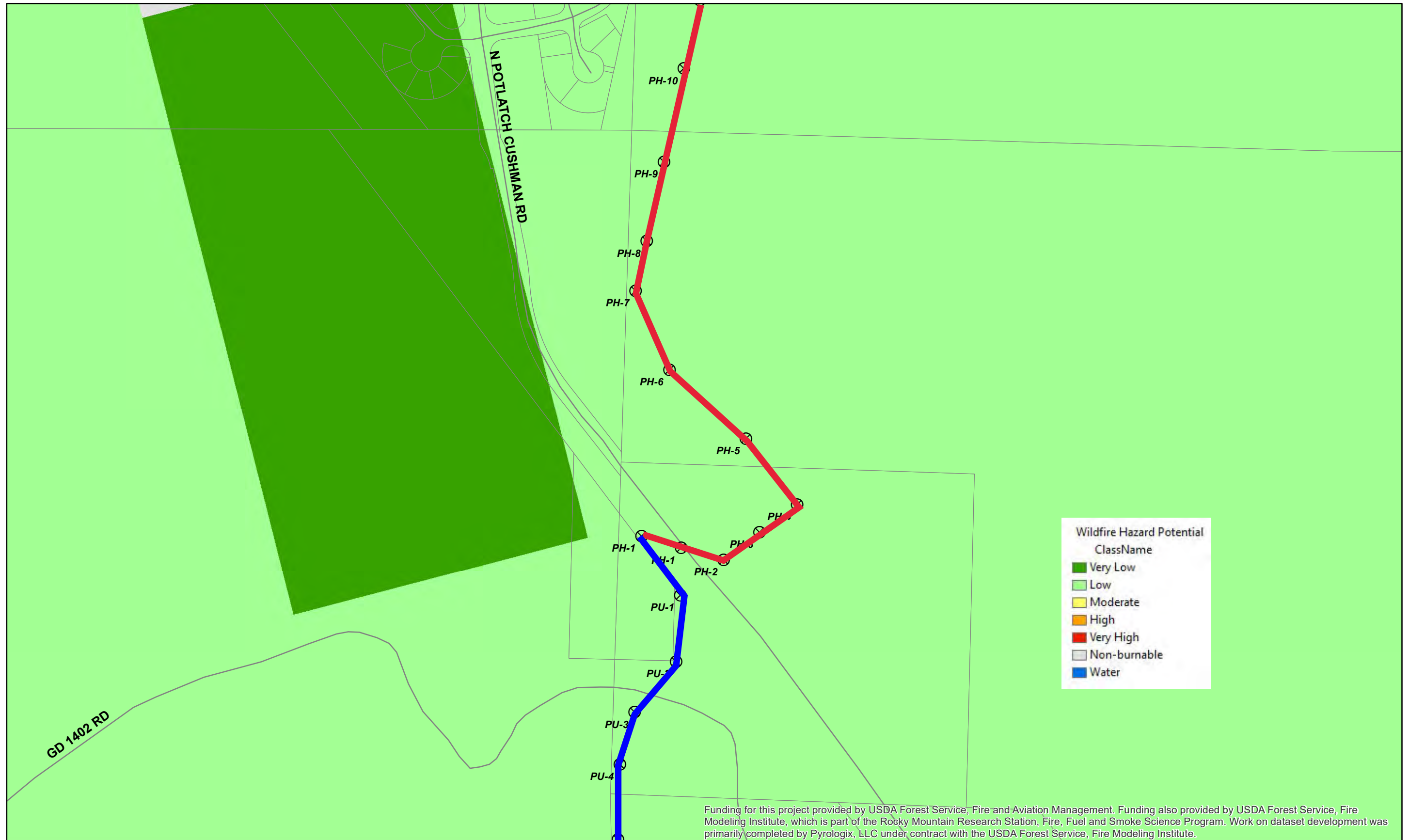
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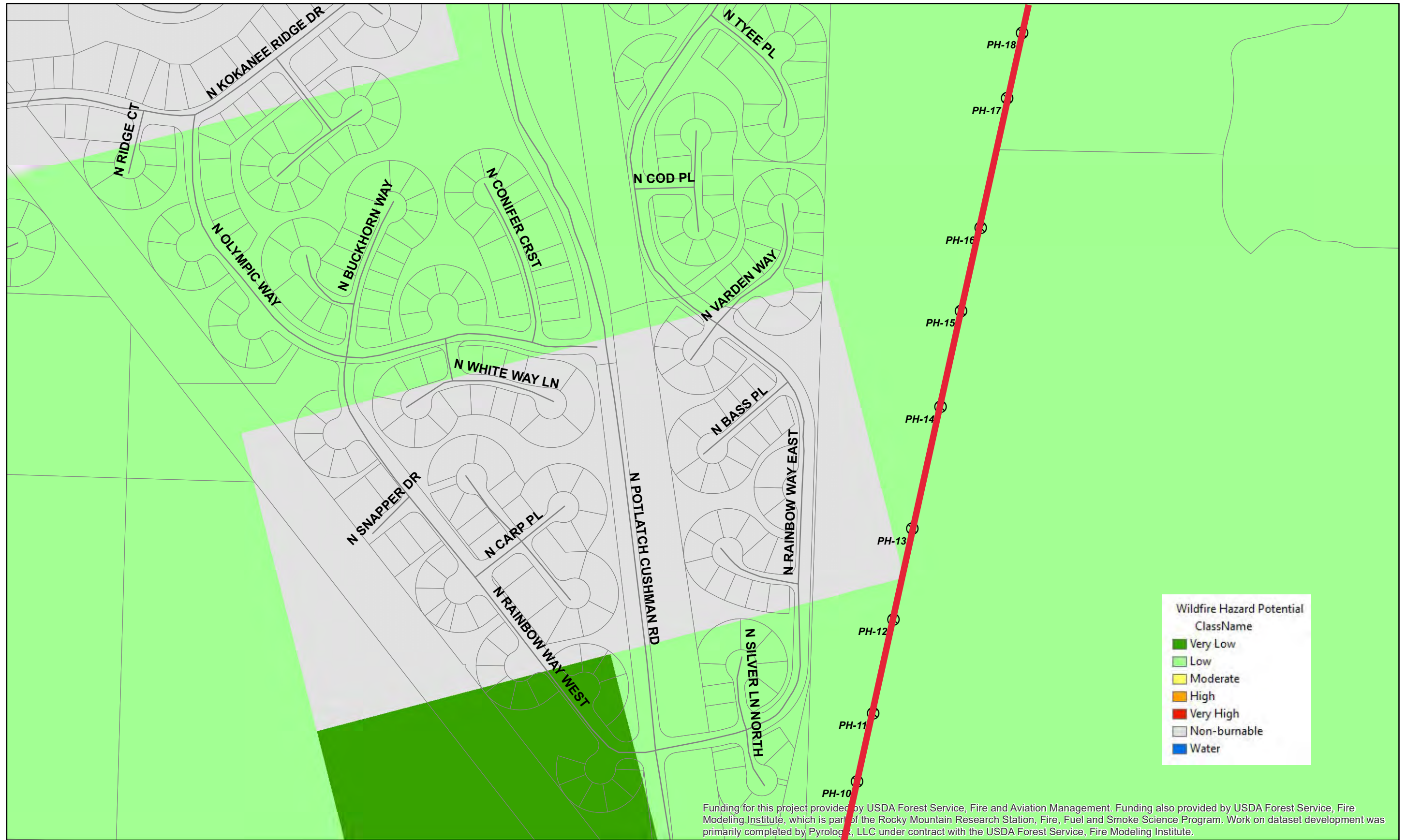


Wildfire Hazard Potential

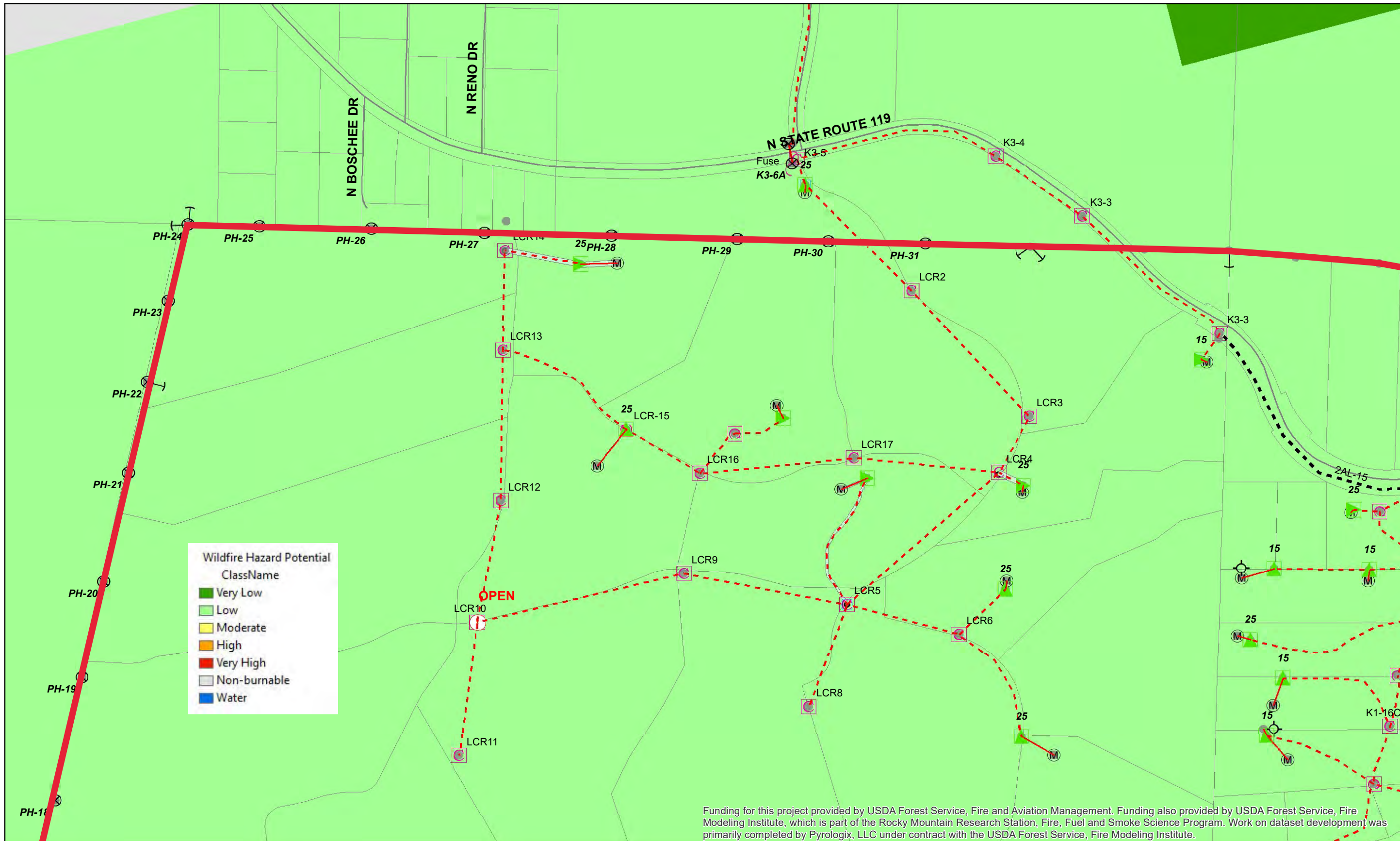
ClassName

- Very Low
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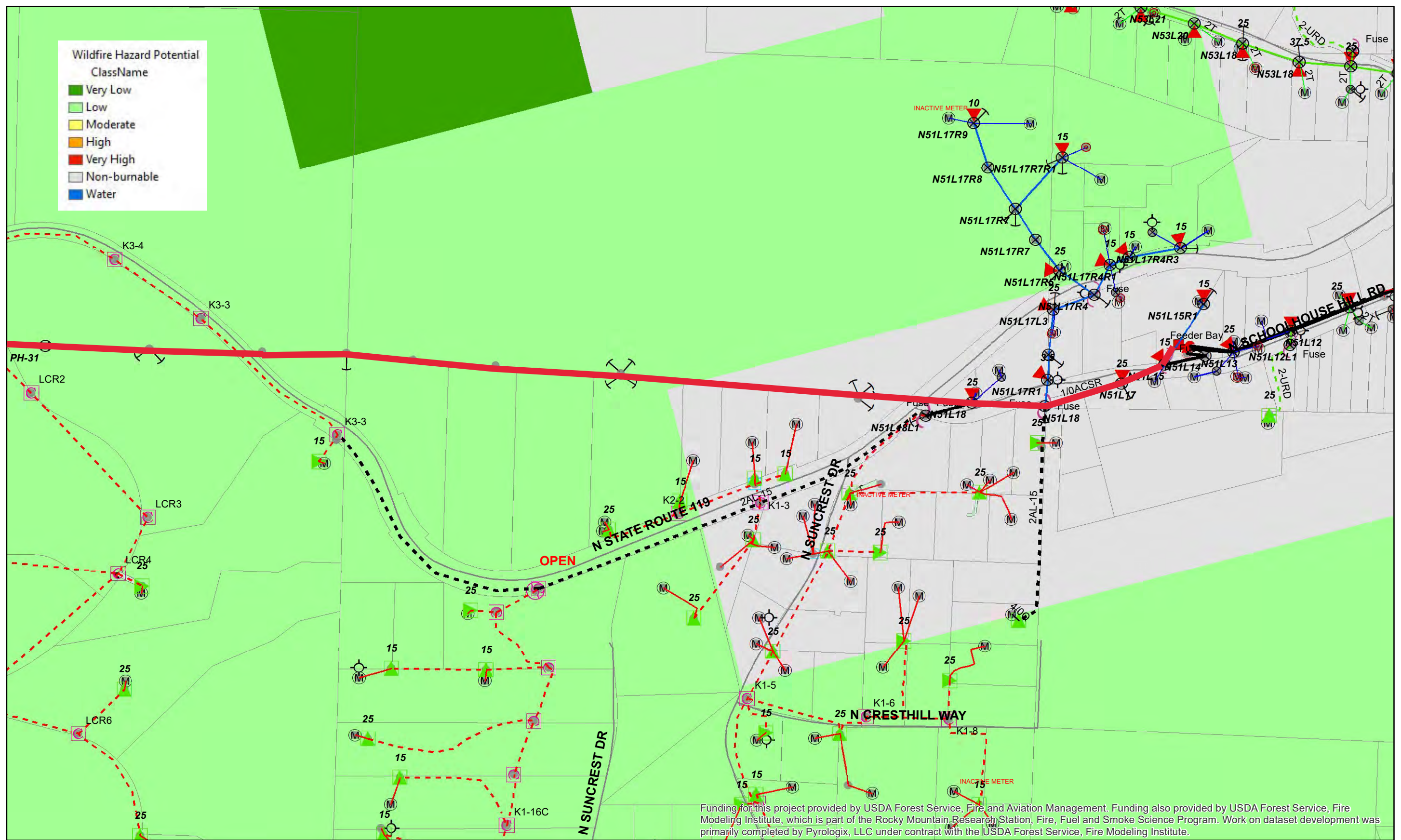


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