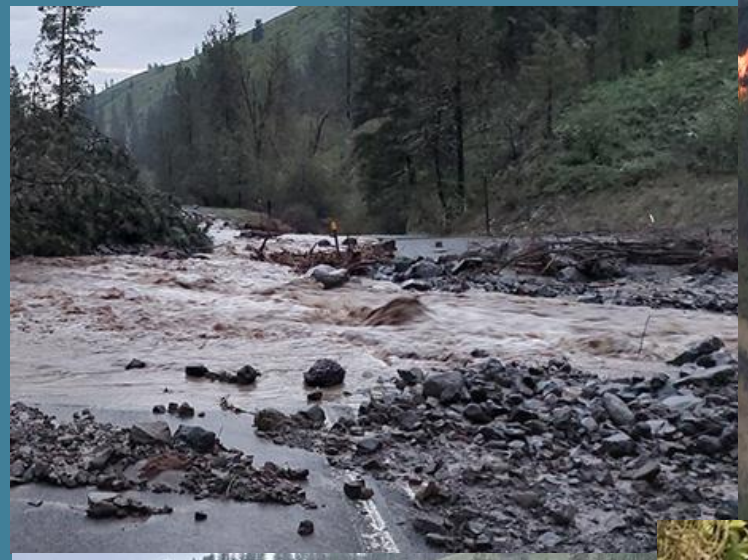
APPLICATION OF LIDAR IMAGERY IN EMERGENCY MITIGATION PROJECTS FOR THE NEZ PERCE TRIBE

Brent Lloyd

EMERGENCY MITIGATION



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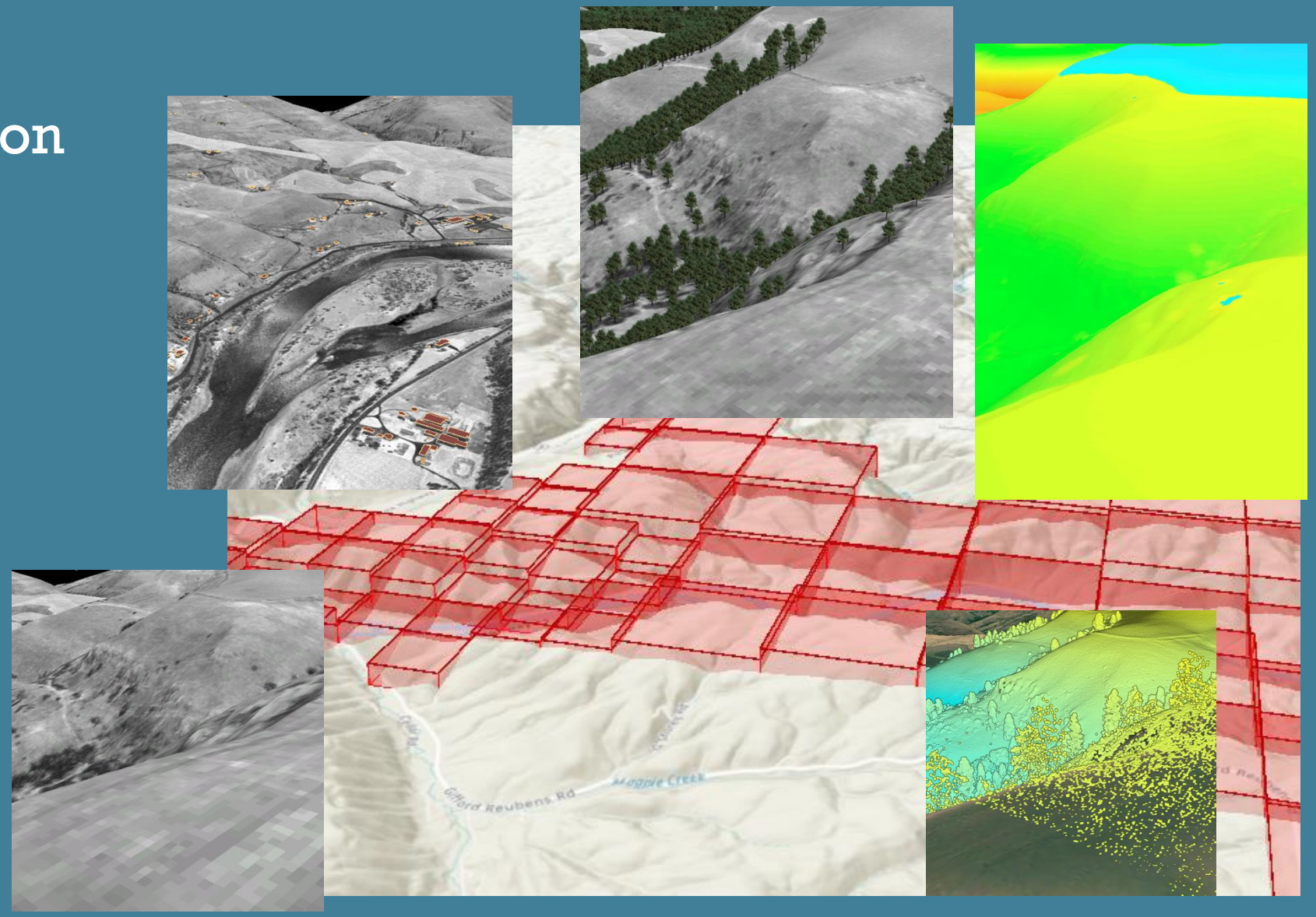
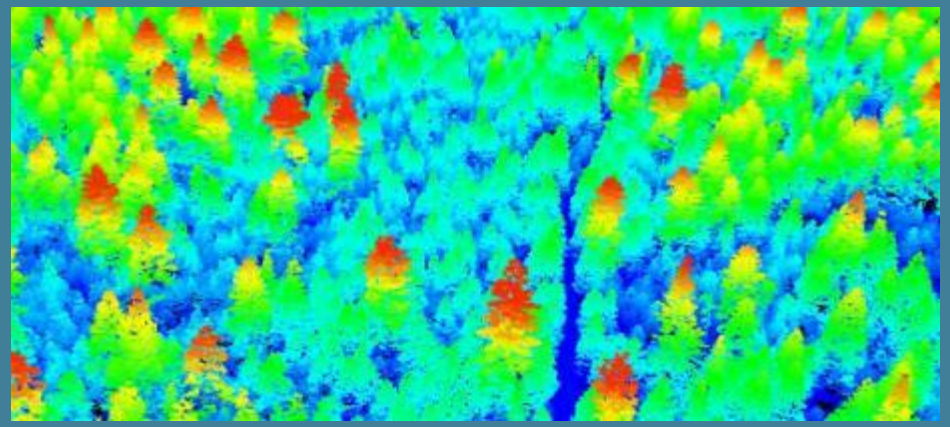
Lidar – Light Detection and Ranging

- Point Cloud
- Digital Elevation Model
- Digital Surface Model
- Trees
- Orthophoto
- Building Structures

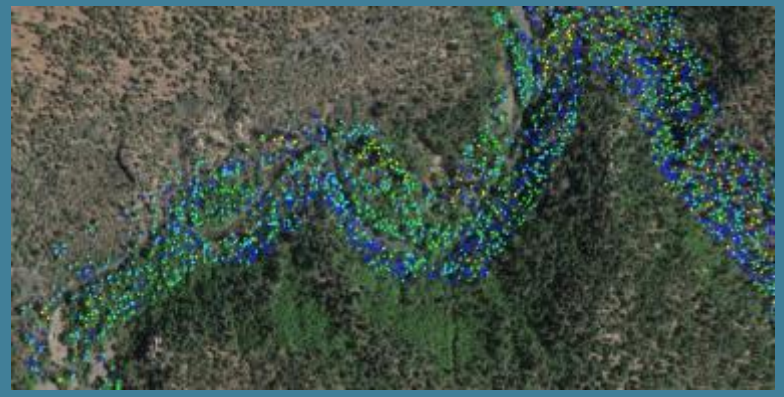


FOREST HEALTH IN EMERGENCY MANAGEMENT



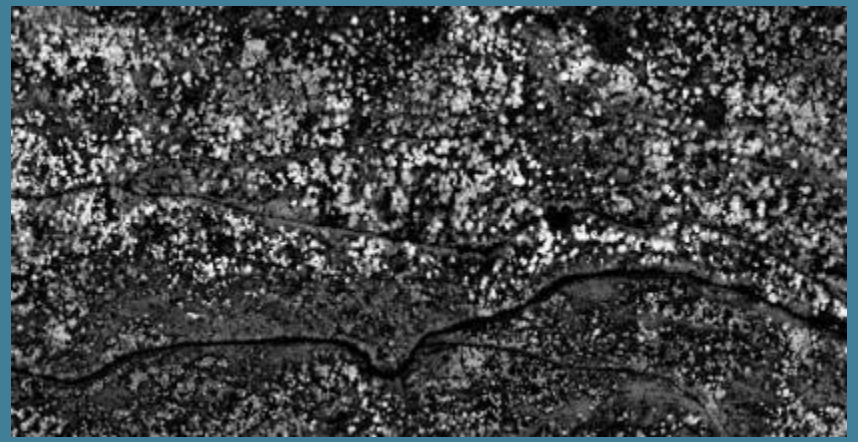
Height Image

DEM



Tree Locations by Species

QA/QC



SEM

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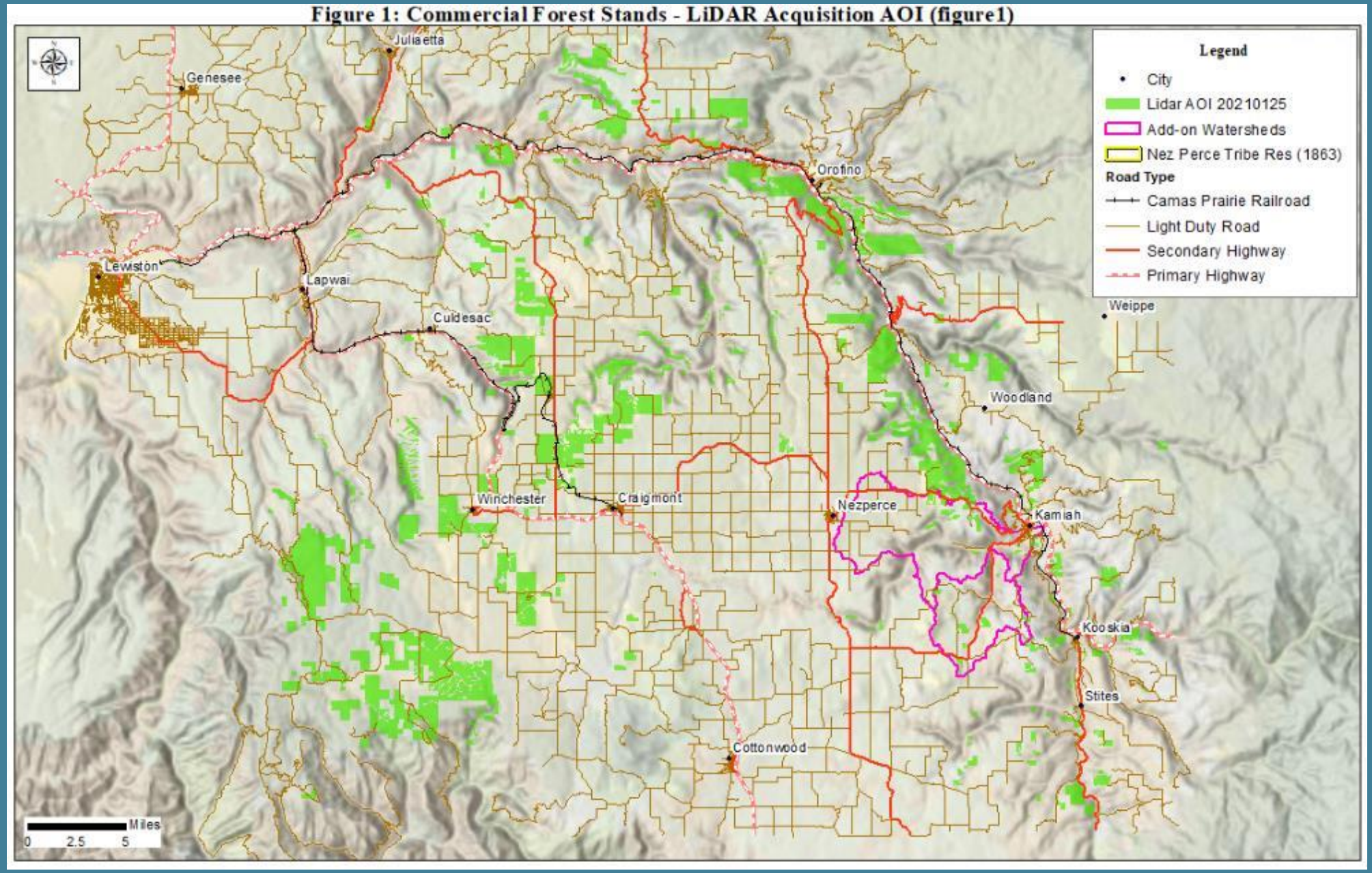
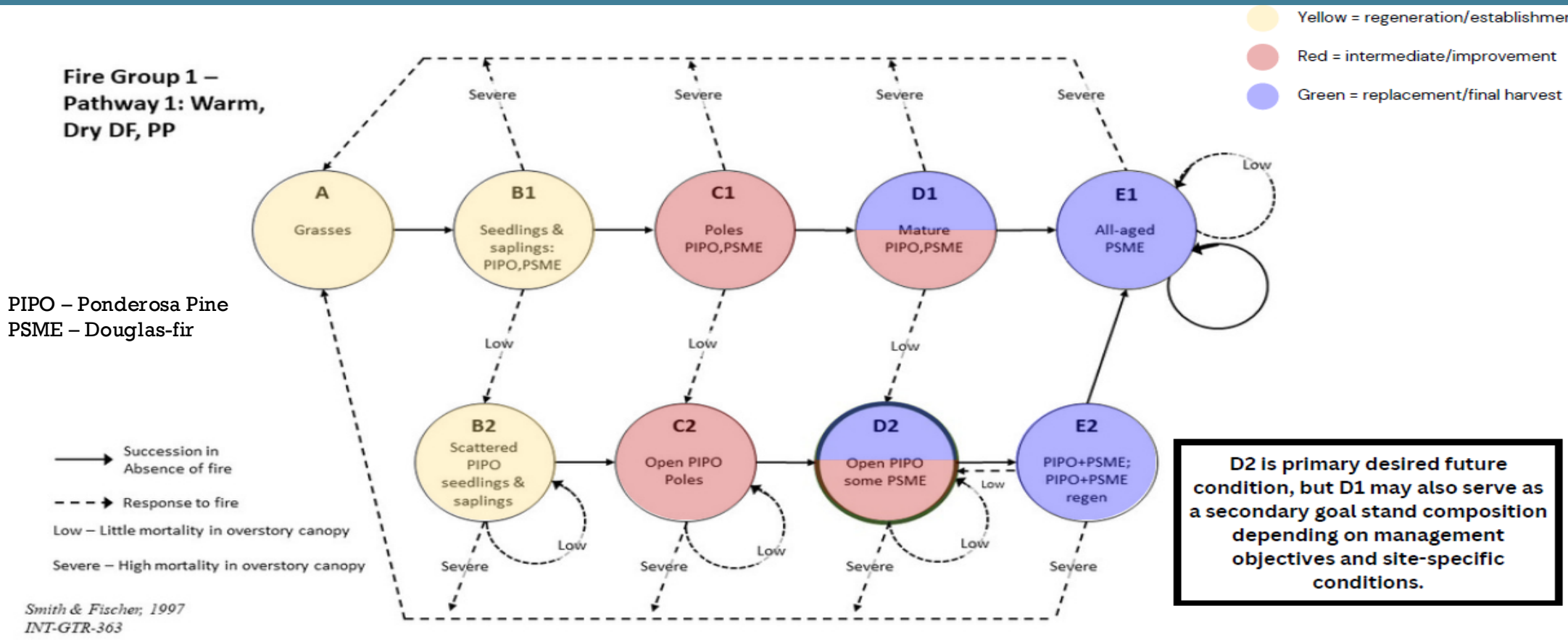


LIDAR COST / TIMELINE

Item	Project Acres	Cost	Delivery Date
Lidar + QA/QC		$107,056.96	08/31/2021
Pre-processing and Field work		$32,263.03	12/31/2021
Lidar Analysis & Inventory		$87,035.15	4/30/2022
FPS Stand / Stock Tables		$25,010.10	6/30/2022
Total	**83,367**	**$229,425.99**	**($2.75 / acre)**

NPT FIRE MANAGEMENT PLAN - SMITH & FISCHER GROUP SUCCESSION PATHWAYS WITH CLIMATE CHANGE ADAPTATION INTERVENTIONS

- Fire Group 1: Pathway 1, Warm, Dry Douglas-fir, Ponderosa Pine.
- Fire Group 2: Pathway 2.2, Warm, Dry to Moderate Douglas-fir, Ponderosa Pine. In this particular fire group pathway, ponderosa pine, western larch, and Douglas-fir are dominant seral species. Grand fir may be present in stands without frequent fire (e.g., D2) and may eventually dominate F
- Fire Group 7: Pathway 7.1, Moderate and Moist Grand Fir Habitat Types. In this particular fire group pathway, succession may be dominated by Douglas-fir and other seral species



When to Consider Climate Change Adaptation Interventions Along Forest Succession Pathway

Early Succession - Establishment

-(A) Plant fire-tolerant and drought-tolerant species
-(A) Acquire seeds from different provenances (future climate-adapted)
-(A) Control planting density
-Allow wildfire
-(A) Conduct salvage logging post-disturbance
-(A, B1, B2) Encourage forage for wild game while encouraging sapling survival
-Proactively coordinate with neighboring jurisdictions on fire response and post-fire decisions based on location and potential severity

Mid Succession - Intermediate

-(C1, C2, D1, D2) Light thinning and cultural burning as needed with low mortality to manage fuel loads and encourage fire- and drought-tolerant species, age-class and structural variability, but moving towards low-density stand
-(C1, C2, D1, D2) Encourage forage for wild game, while encouraging individual tree growth
-Identify potential future fuel break locations, create where needed
-Monitor for density, fire, insects and disease
-Encourage large PIPO, PSME

Late Succession - Replacement

-(D1, D2, E2) Thinning and cultural burning with low mortality to retain large, vigorous fire- and drought-tolerant individuals (i.e., PIPO, some PSME), at lower density and manage fuels
-(E1) Consider heavy thin and cultural burn
-(D1, D2, E2) Maintain some age-class and structural variability
-(D1, D2, E2) Maintain wild game habitat and forage
-Manage fuel break locations
-Monitor for density, fire, insects and disease
-Protect large PIPO, PSME

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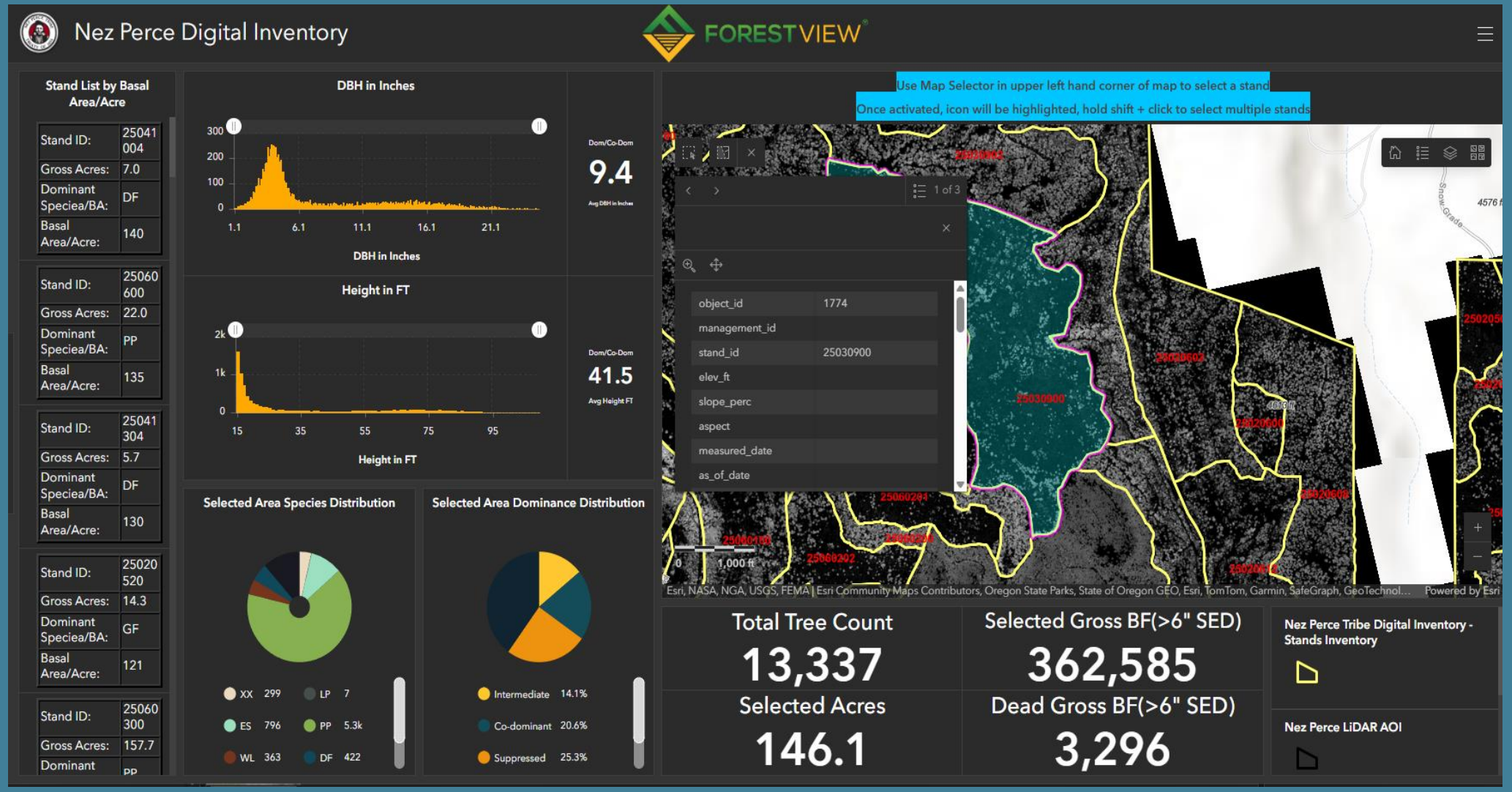

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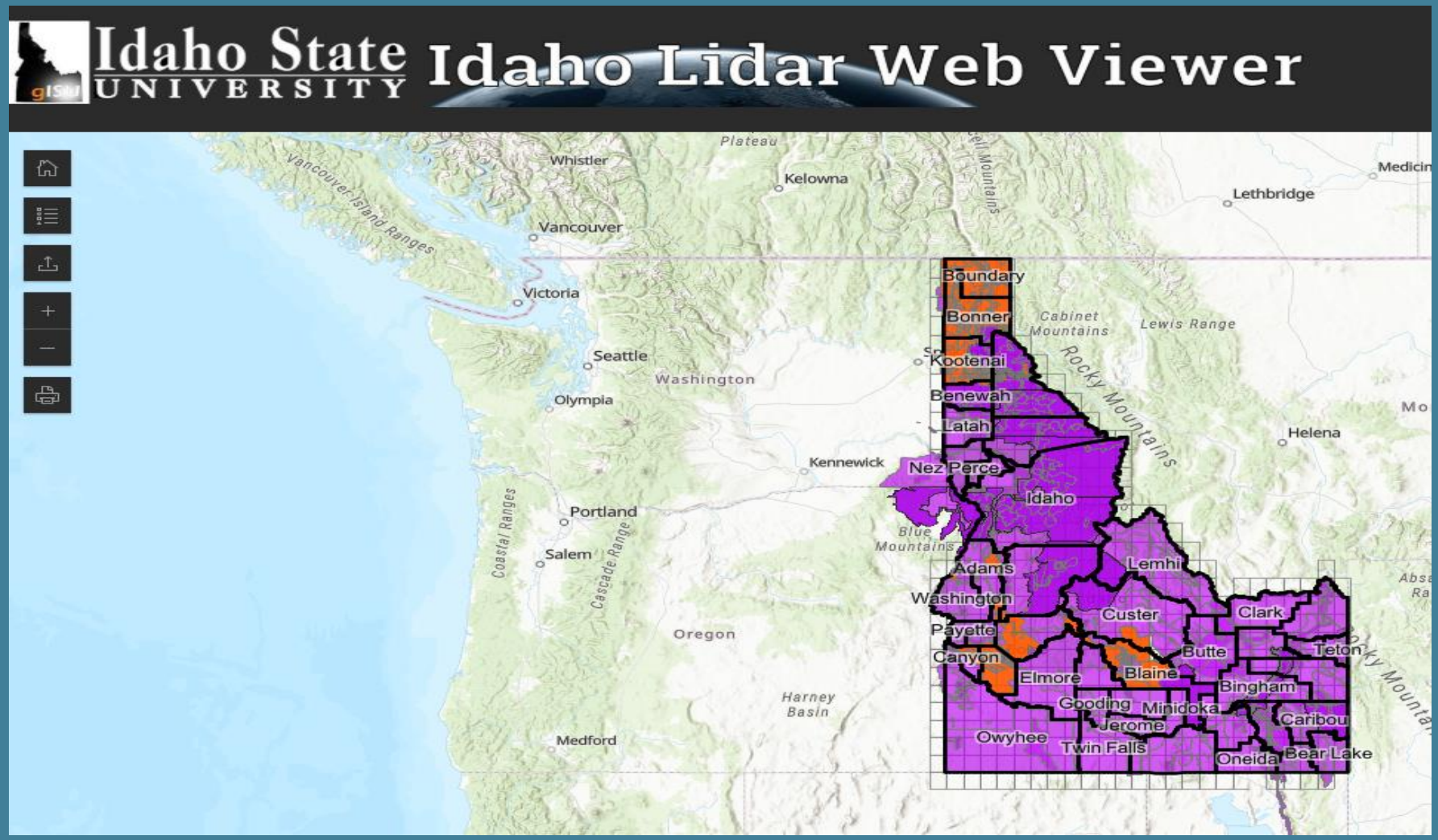

[Idaho Lidar Consortium]

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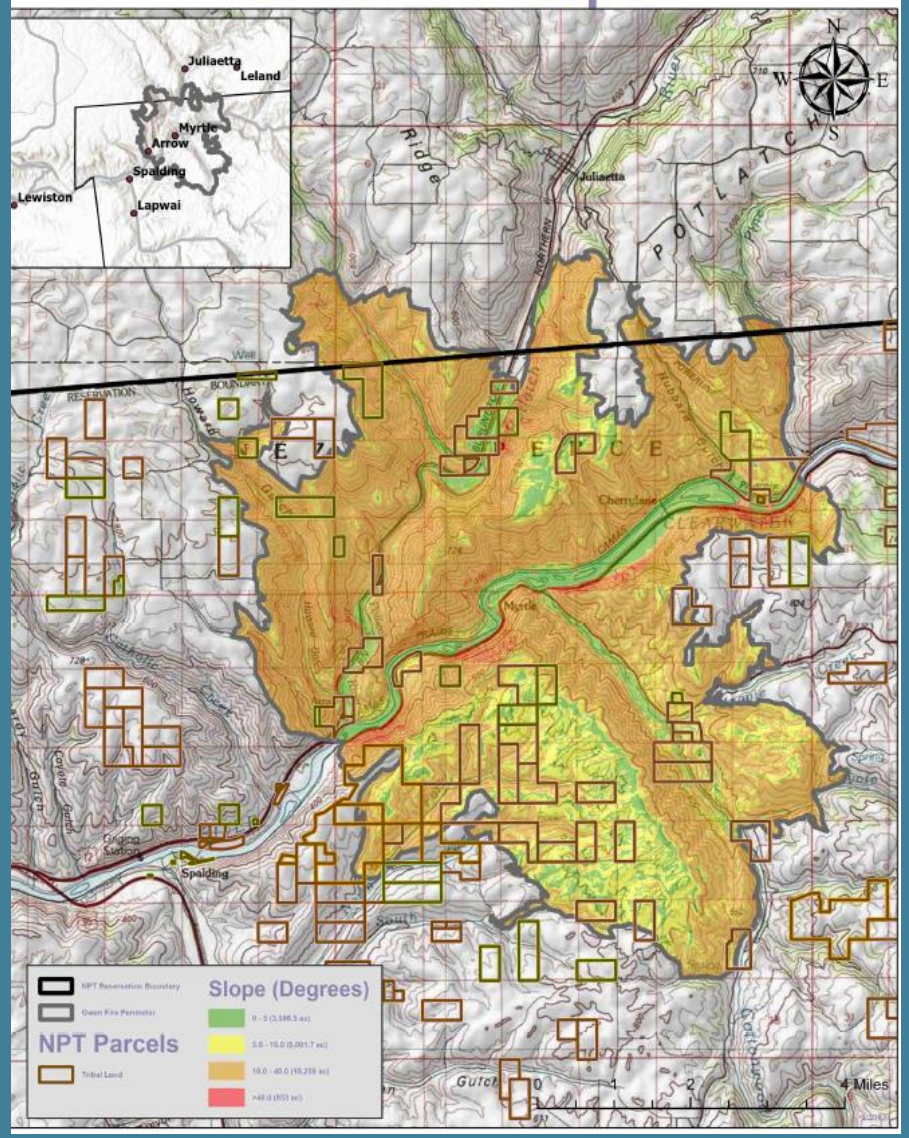
Gwen Fire Slope

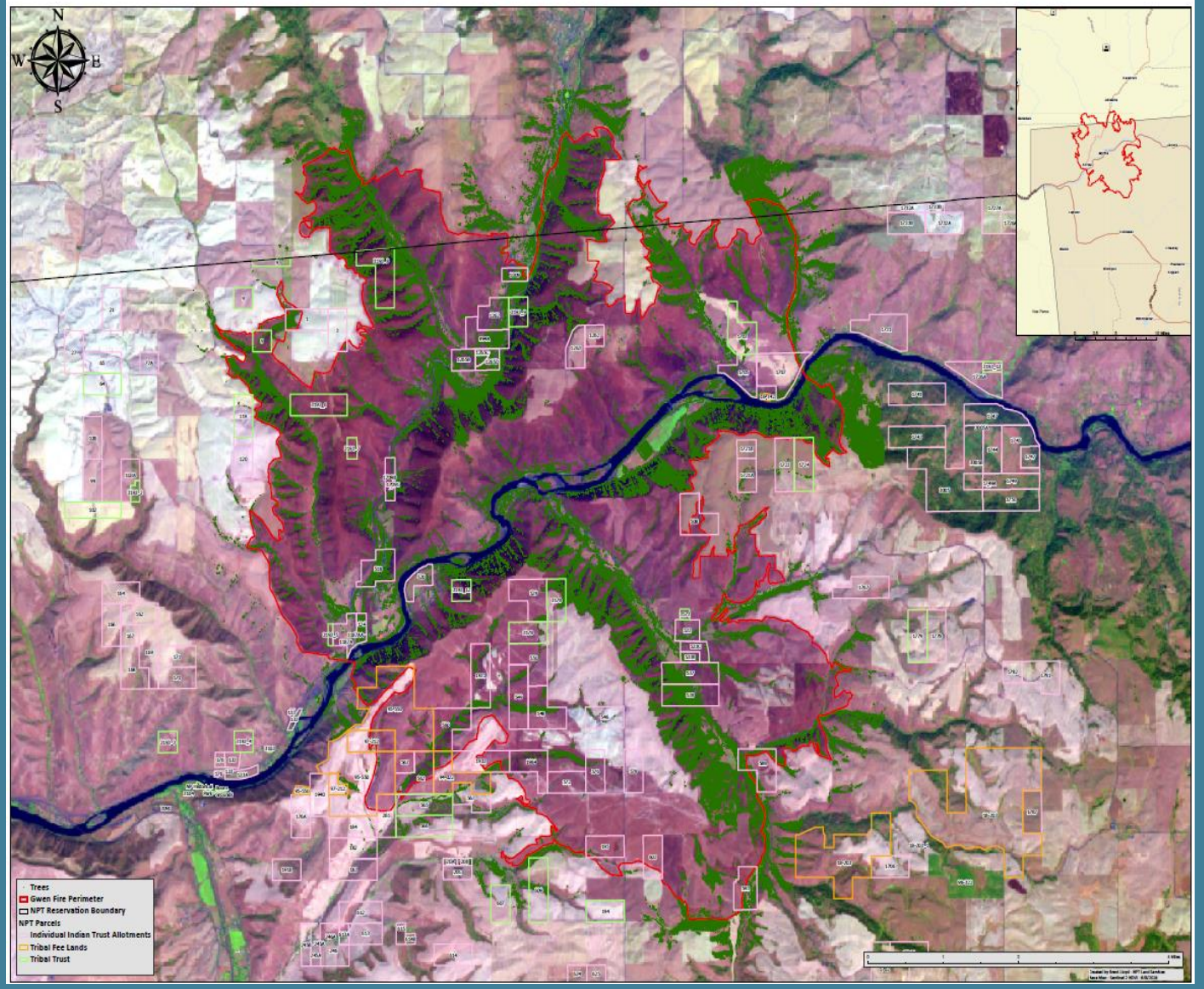


Structure Perimeters

PolID	BlkID	CLASS_NAME	CLASS_ID	MinHeight	MaxHeight	Area	Perimeter	Length	Width	Orientatio
784	784	bldgs	2	309.07	309.86	44.29	16.12	8.5	5.75	24.11
1898	1898	bldgs	2	311.13	311.97	192.13	20.69	20.5	9.62	19.53
1899	1899	bldgs	2	311	312.56	132.25	12.48	13	11	-67.04
783	783	bldgs	2	311.73	313.44	240.69	37.14	19	13	24.68
1897	1897	bldgs	2	308.52	315.7	293.41	25.95	28.25	12	-68.71

Structures Destroyed: 156
Homes Destroyed: 38

Gwen Fire Burned Areas



	OBJECTID *	Shape *	Height	Radius
1	1553	Point ZM	4.96	3.6
2	1559	Point ZM	5.56	2.8
3	1560	Point ZM	6.07	2
4	1562	Point ZM	6.39	3.2
5	1565	Point ZM	6.44	3.2
6	1571	Point ZM	7.55	3.2
7	1576	Point ZM	7.14	4.4
8	1580	Point ZM	7.45	3.6
9	1581	Point ZM	7.72	5.6
10	1582	Point ZM	8.15	2.8
11	1584	Point ZM	8.36	2.8
12	4116	Point ZM	2.41	2
13	4117	Point ZM	3.55	2.4
14	4118	Point ZM	3.49	2

Total Trees: 294, 263 within fire perimeter

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Digital Elevation Model (DEM)

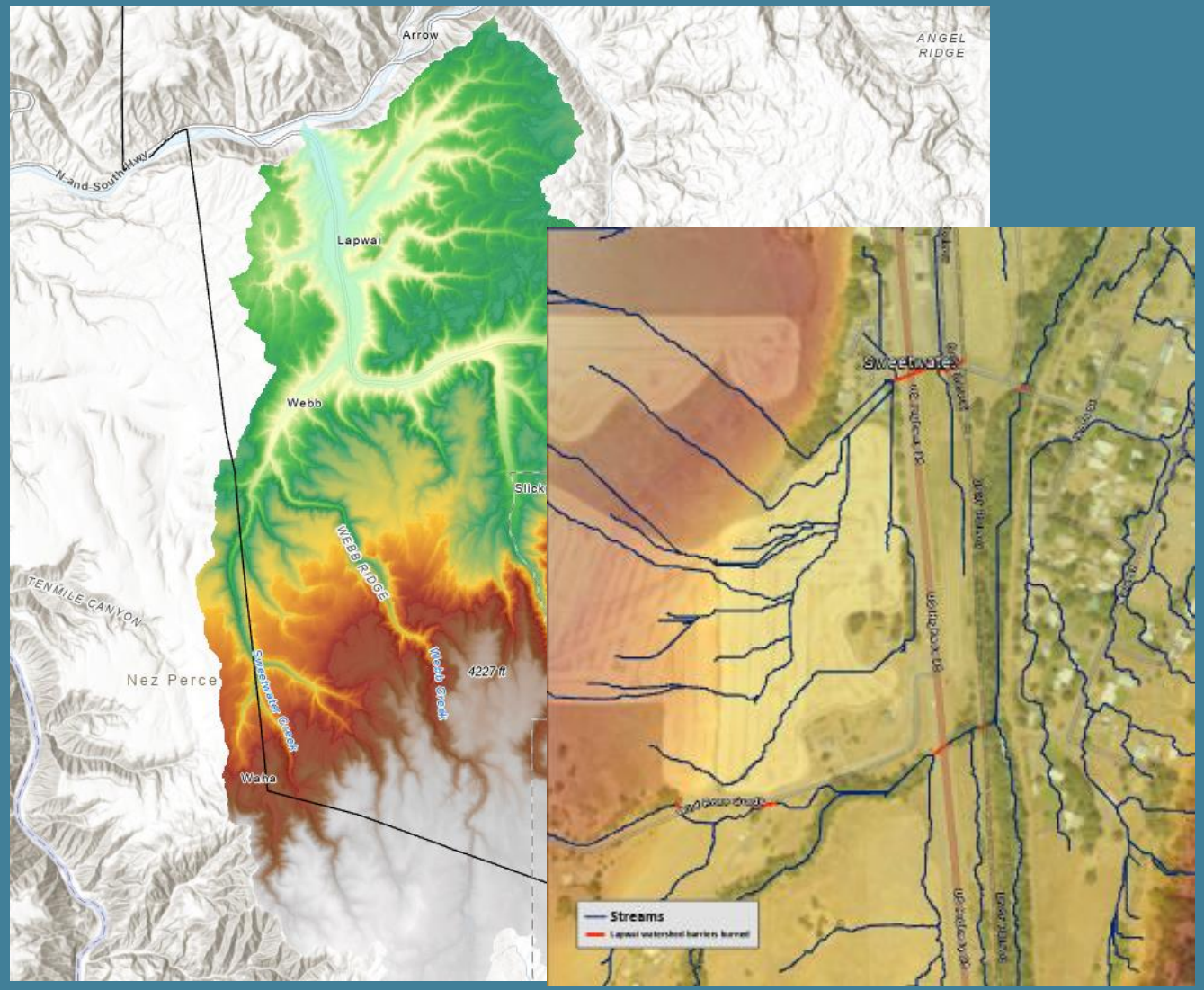
Barrier Inventory
- Bridges
- Culverts

Burned Culverts in DEM

Flow Direction

Flow Accumulation

Stream Order



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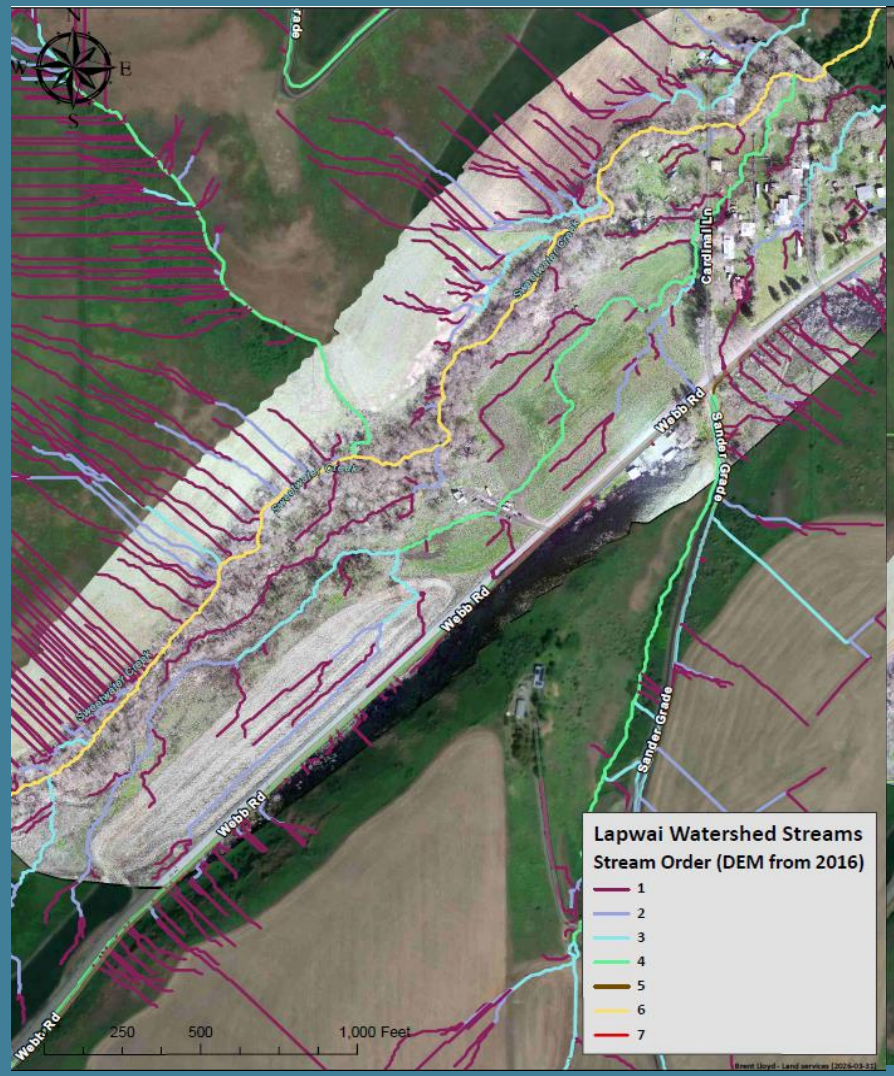
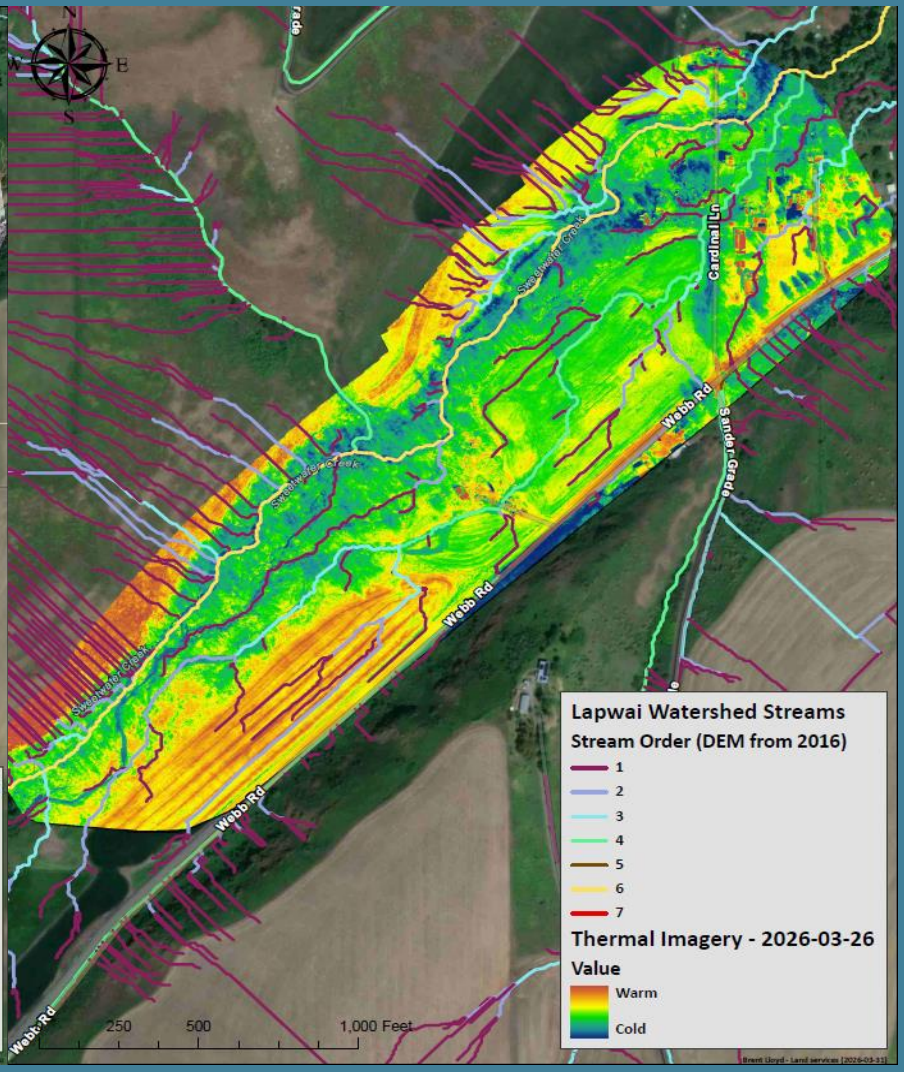
Houses Flooded in March 2026





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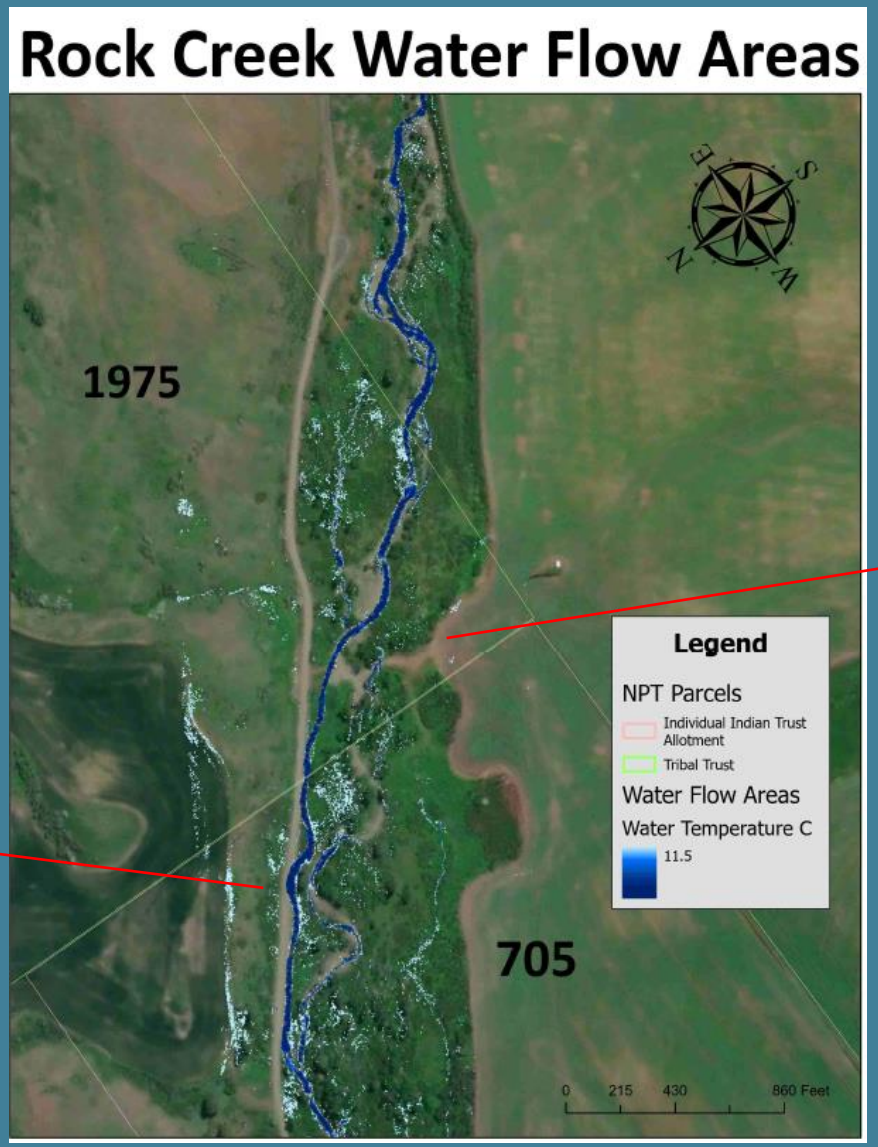
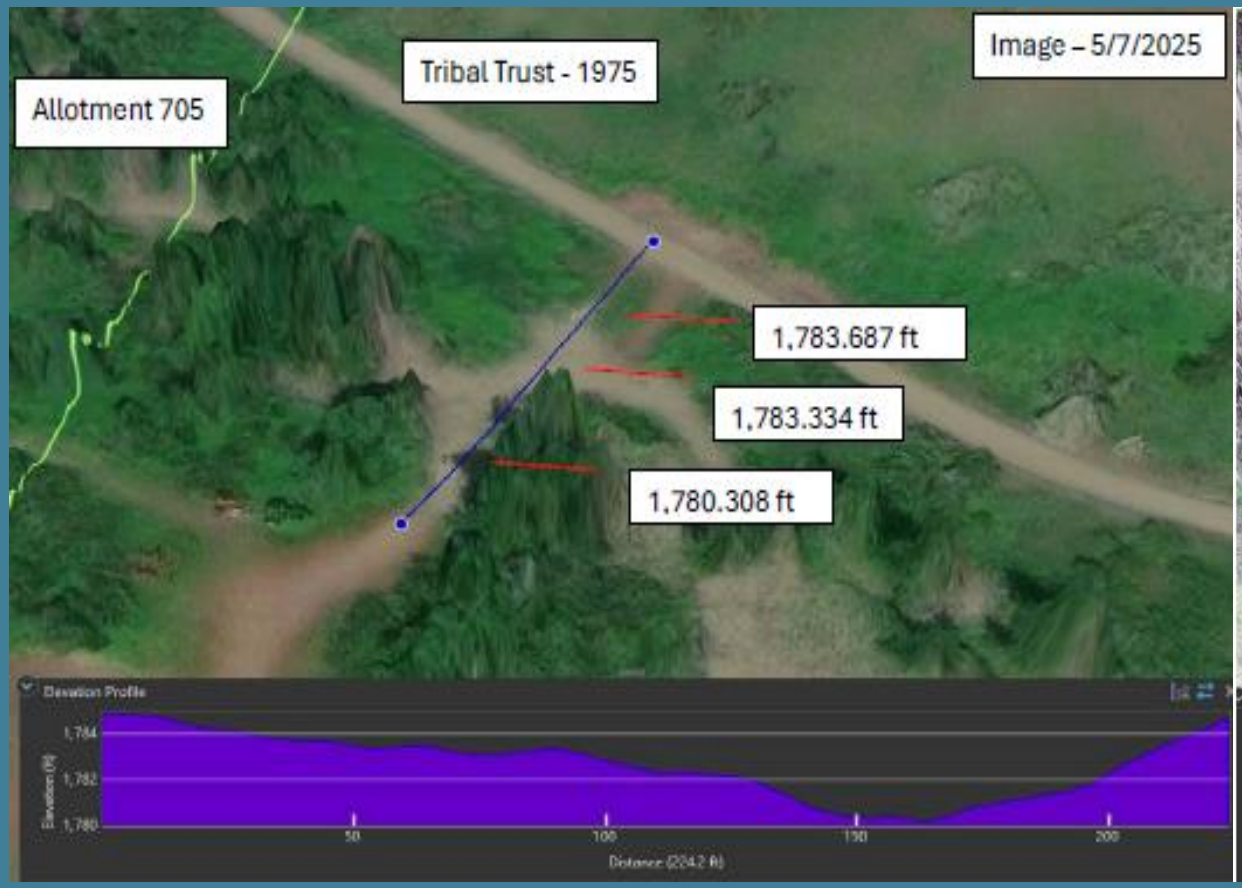
Rock Creek Flooding



Rock Creek Flooding – Road Access



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Rock Creek Flooding

Road Damage