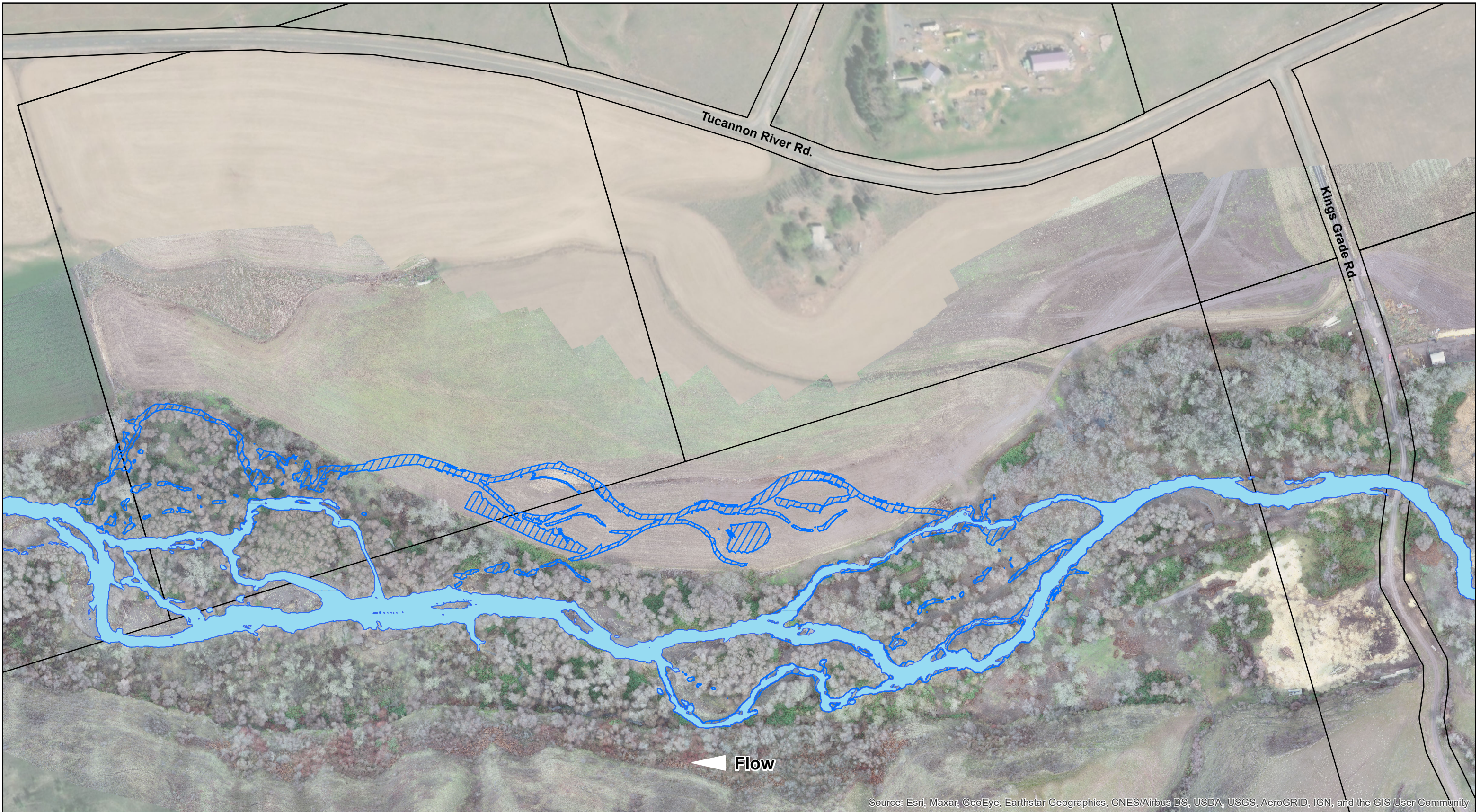
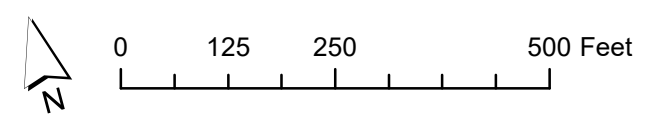


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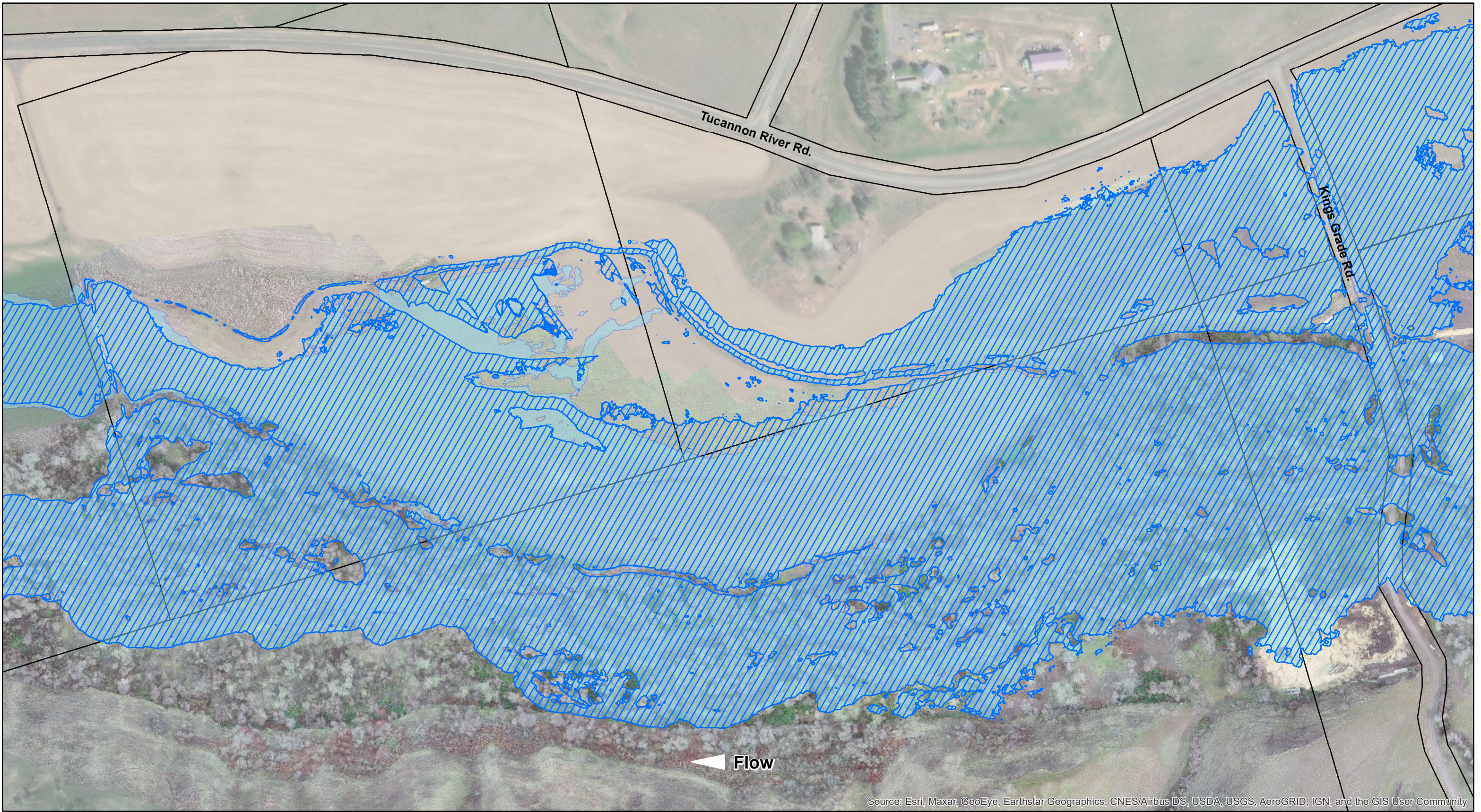
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



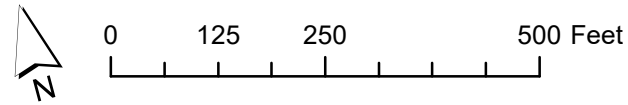
- Existing Winter Base Flow Extent (~100cfs)
- Proposed Winter Base Flow Extent (~100cfs)
- Columbia County Taxlots (2019)




**Tucannon River PA 27/28**  
 Modeling Results - 80% Design  
 Winter Base Flow (~100 cfs)

Document Path: L:\Shared\W2\GIS\GIS Projects\2019\20190026 - Tucannon River\maps\Additional Modeling Maps\Phase 3\Inundation\_25yr\_80pct.mxd



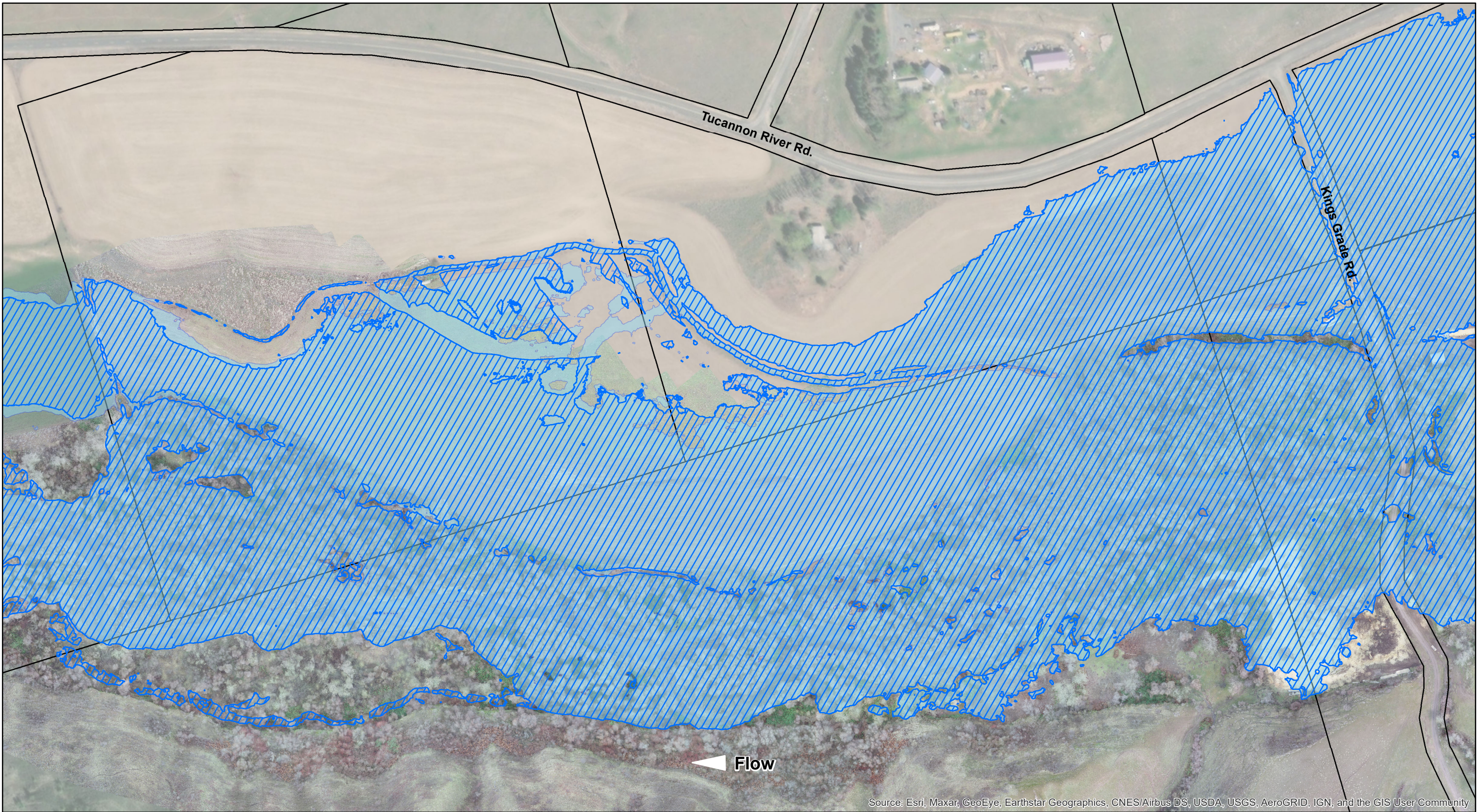
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



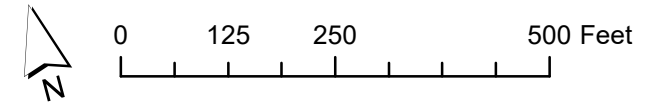
-  Proposed 25-Year Flow Extent (~3,561cfs)
-  Existing 25-Year Flow Extent (~3,561cfs)
-  Columbia County Taxlots (2019)

**Tucannon River PA 27/28**  
 Modeling Results - 80% Design  
 25-Year Flood (~3,561 cfs)

Document Path: L:\Shared\W2\GIS\GIS Projects\2019\20190026 - Tucannon River\maps\Additional Modeling Maps\Phase 3\Inundation\_100yr\_80pct.mxd



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

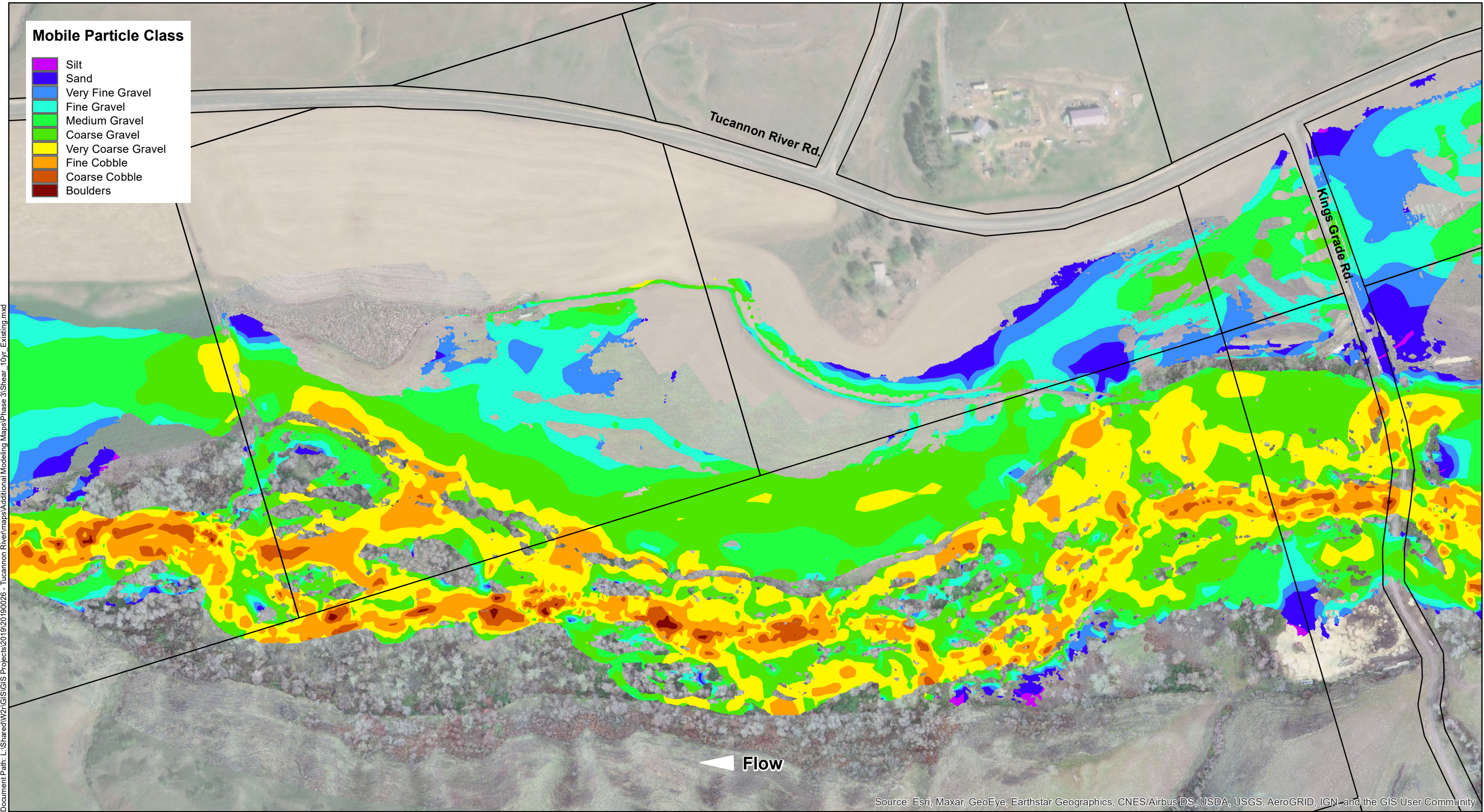


- Proposed 100-Year Flow Extent (~5,495cfs)
- Existing 100-Year Flow Extent (~5,495cfs)
- Columbia County Taxlots (2019)

**Tucannon River PA 27/28**  
 Modeling Results - 80% Design  
 100-Year Flood (~5,495 cfs)

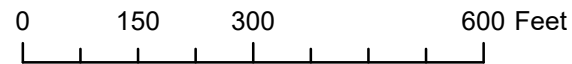
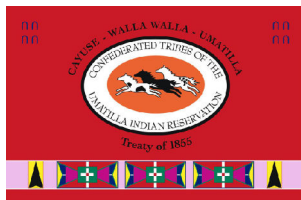
**Mobile Particle Class**


-  Silt
-  Sand
-  Very Fine Gravel
-  Fine Gravel
-  Medium Gravel
-  Coarse Gravel
-  Very Coarse Gravel
-  Fine Cobble
-  Coarse Cobble
-  Boulders



Document Path: L:\Shared\W2\GIS\GIS Projects\2019\20190026 - Tucannon River\maps\Additional Modeling Maps\Phase 3\Shear\_10yr\_Existing.mxd

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

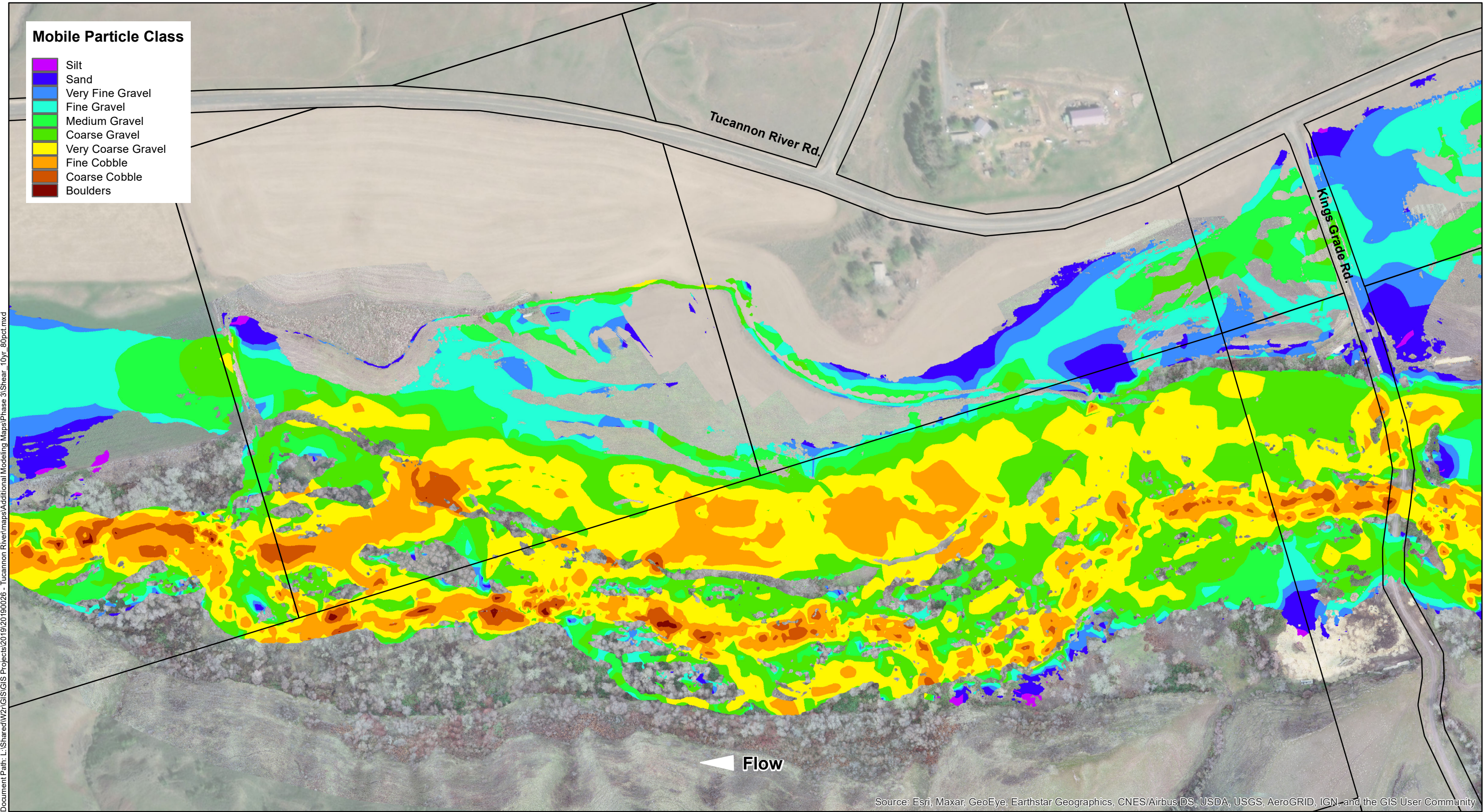


 Columbia County Taxlots (2019)

**Tucannon River PA 27/28**  
Shear Modeling Results - Existing  
Q10 (~2440 cfs)

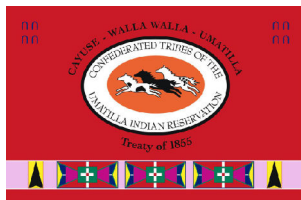
**Mobile Particle Class**

- Silt
- Sand
- Very Fine Gravel
- Fine Gravel
- Medium Gravel
- Coarse Gravel
- Very Coarse Gravel
- Fine Cobble
- Coarse Cobble
- Boulders



Document Path: L:\Shared\W2\GIS\GIS Projects\2019\20190026 - Tucannon River\maps\Additional Modeling Maps\Phase 3\Shear\_10yr\_80pct.mxd

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

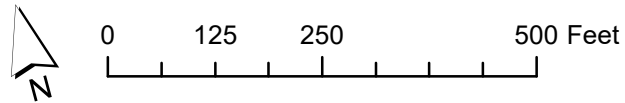
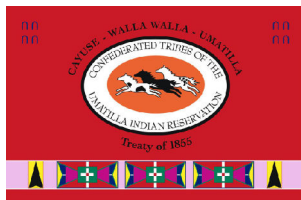
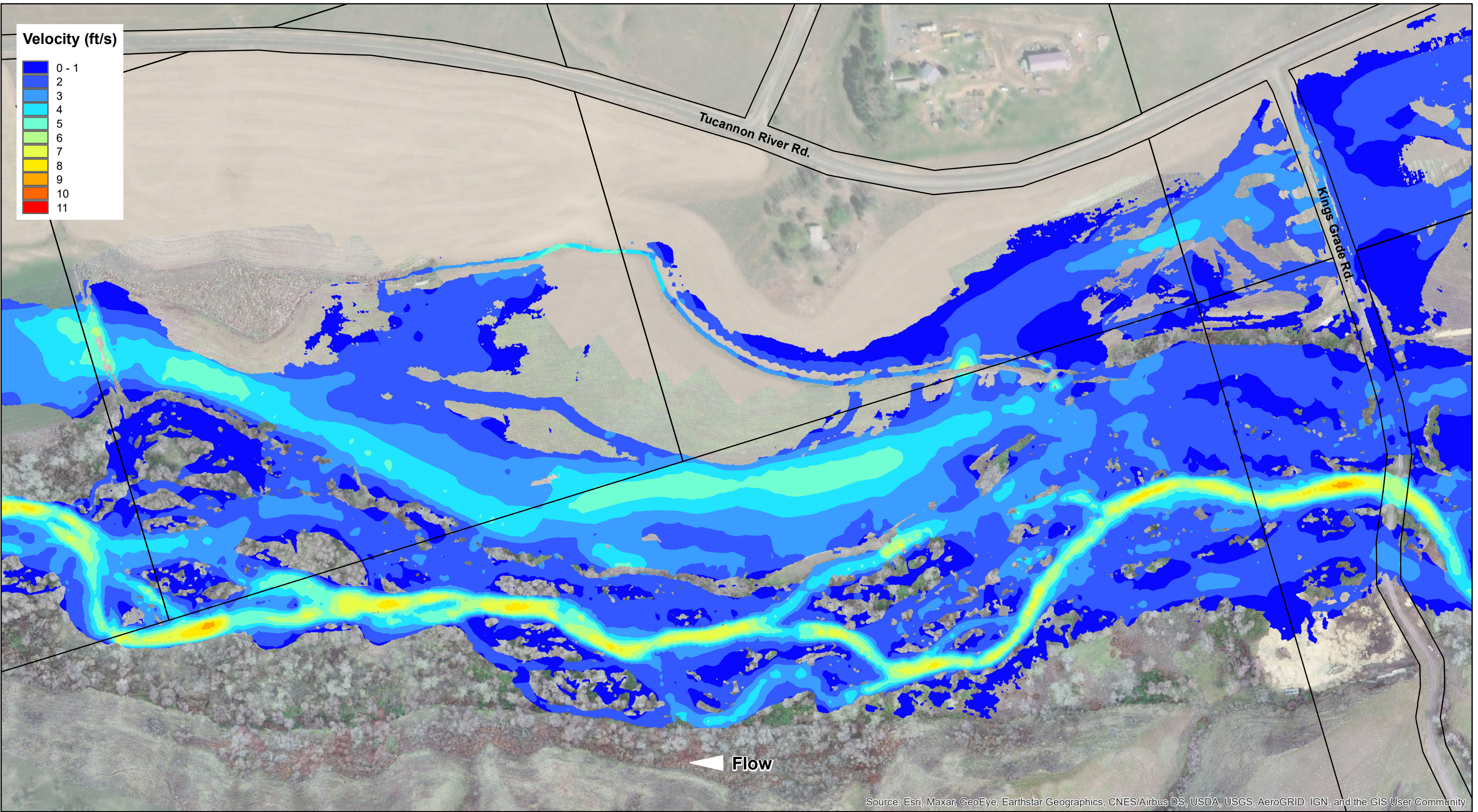


0 150 300 600 Feet

□ Columbia County Taxlots (2019)

**Tucannon River PA 27/28**  
Shear Modeling Results - 80% Design  
Q10 (~2440 cfs)

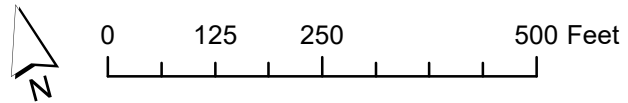
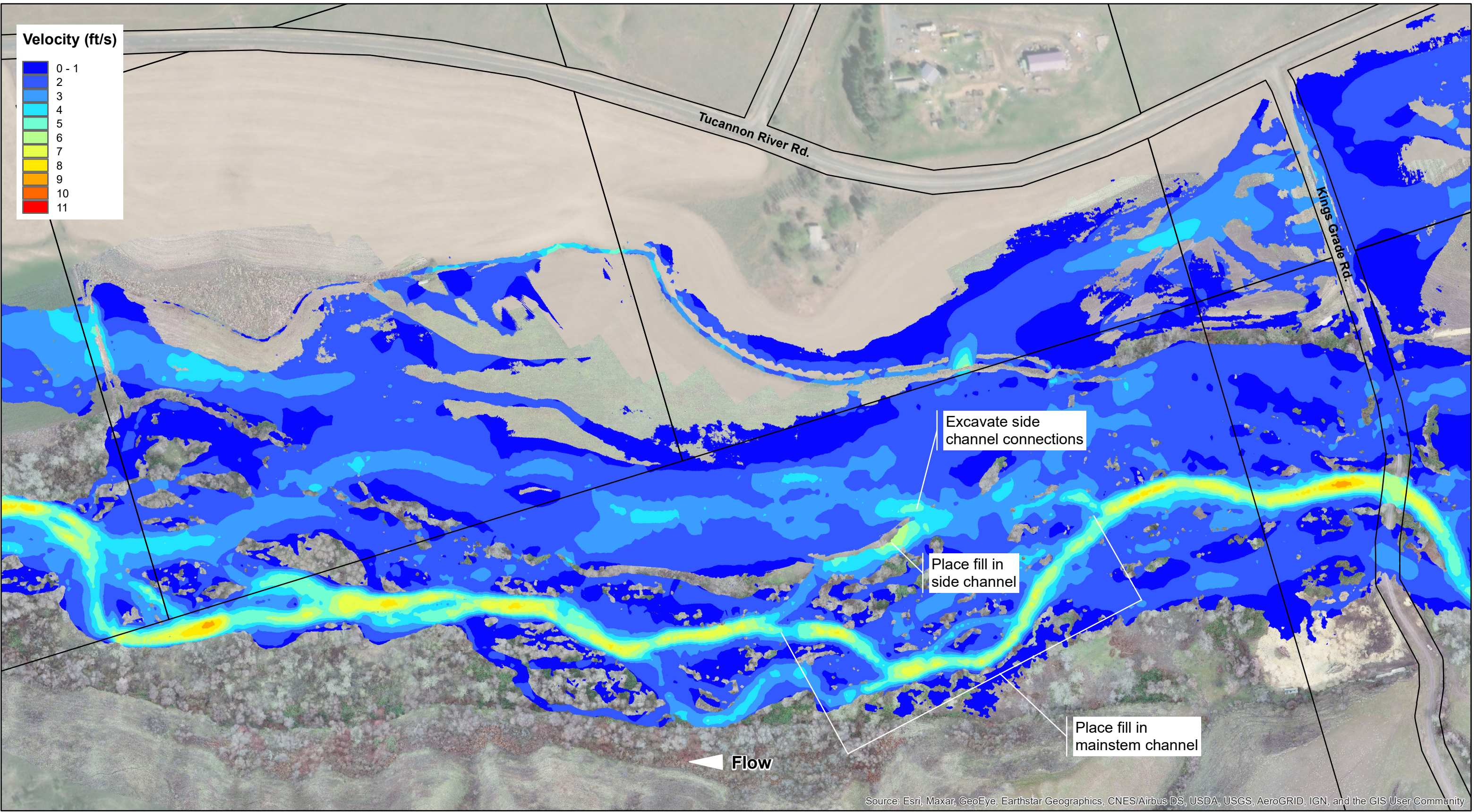
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□ Columbia County Taxlots (2019)

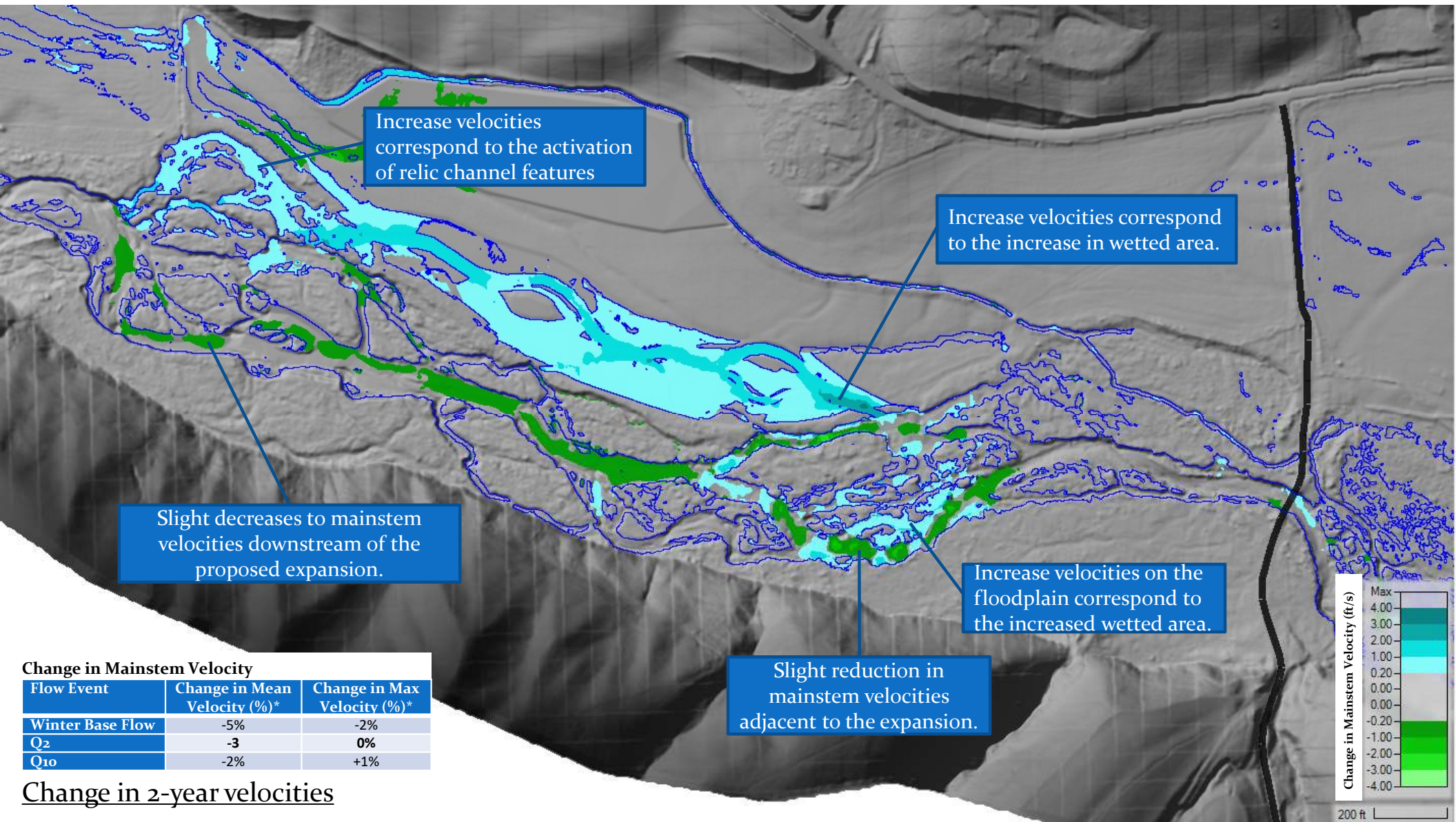
**Tucannon River PA 27/28**  
 Velocity Modeling Results - Existing  
 Q10 (~2440 cfs)

Document Path: L:\Shared\W2r\GIS\GIS Projects\2019\20190026 - Tucannon River\maps\Additional Modeling Maps\Phase 3\Velocity\_10yr\_Proposed.mxd



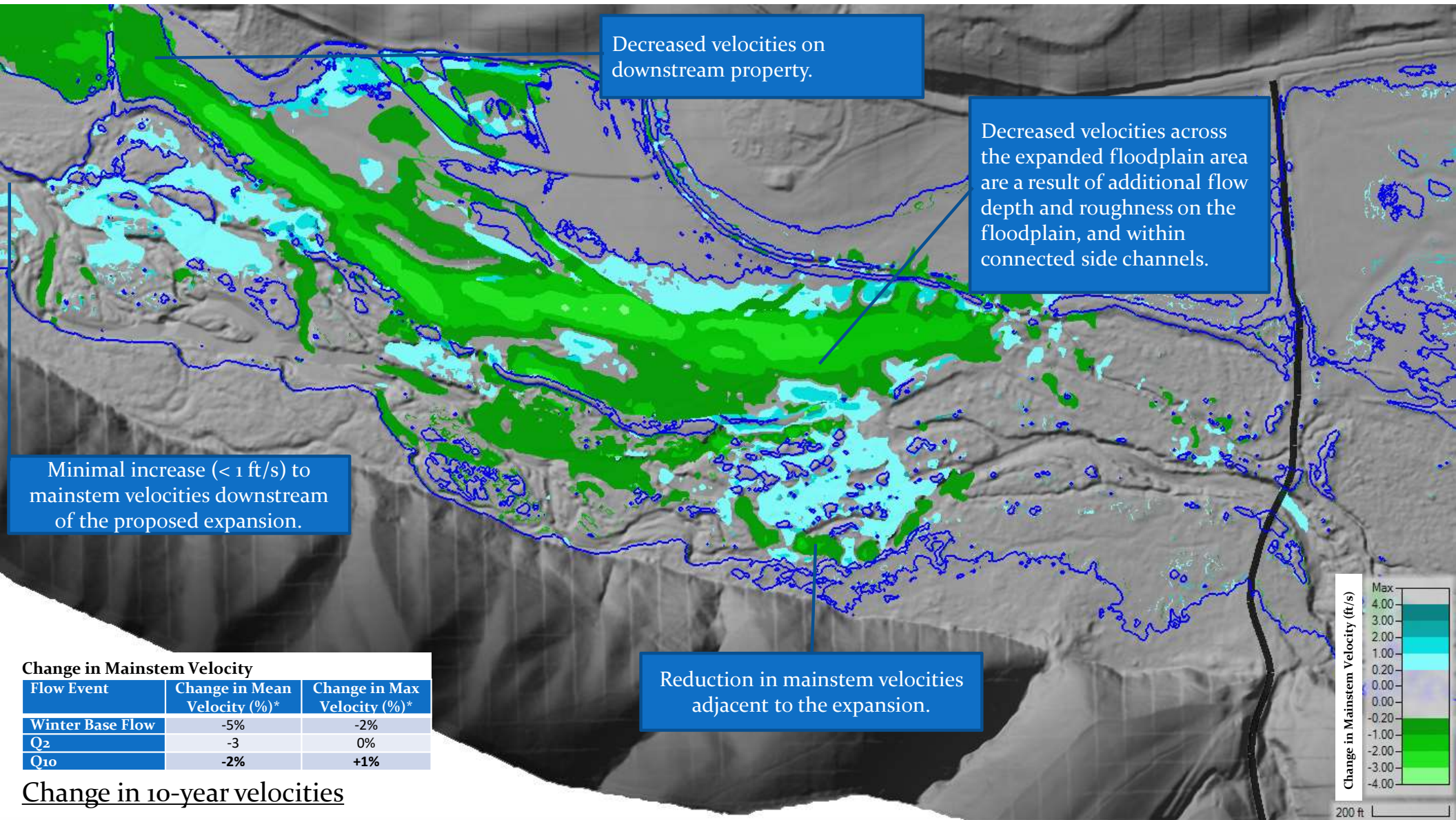
□ Columbia County Taxlots (2019)

**Tucannon River PA 27/28**  
 Velocity Modeling Results - Proposed  
 Q10 (~2440 cfs)



| Change in Mainstem Velocity |                              |                             |
|-----------------------------|------------------------------|-----------------------------|
| Flow Event                  | Change in Mean Velocity (%)* | Change in Max Velocity (%)* |
| Winter Base Flow            | -5%                          | -2%                         |
| Q2                          | -3                           | 0%                          |
| Q10                         | -2%                          | +1%                         |

Change in 2-year velocities



Decreased velocities on downstream property.

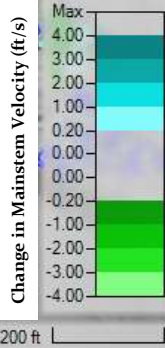
Decreased velocities across the expanded floodplain area are a result of additional flow depth and roughness on the floodplain, and within connected side channels.

Minimal increase (< 1 ft/s) to mainstem velocities downstream of the proposed expansion.

Reduction in mainstem velocities adjacent to the expansion.

| Change in Mainstem Velocity |                              |                             |
|-----------------------------|------------------------------|-----------------------------|
| Flow Event                  | Change in Mean Velocity (%)* | Change in Max Velocity (%)* |
| Winter Base Flow            | -5%                          | -2%                         |
| Q2                          | -3                           | 0%                          |
| Q10                         | -2%                          | +1%                         |

Change in 10-year velocities



200 ft