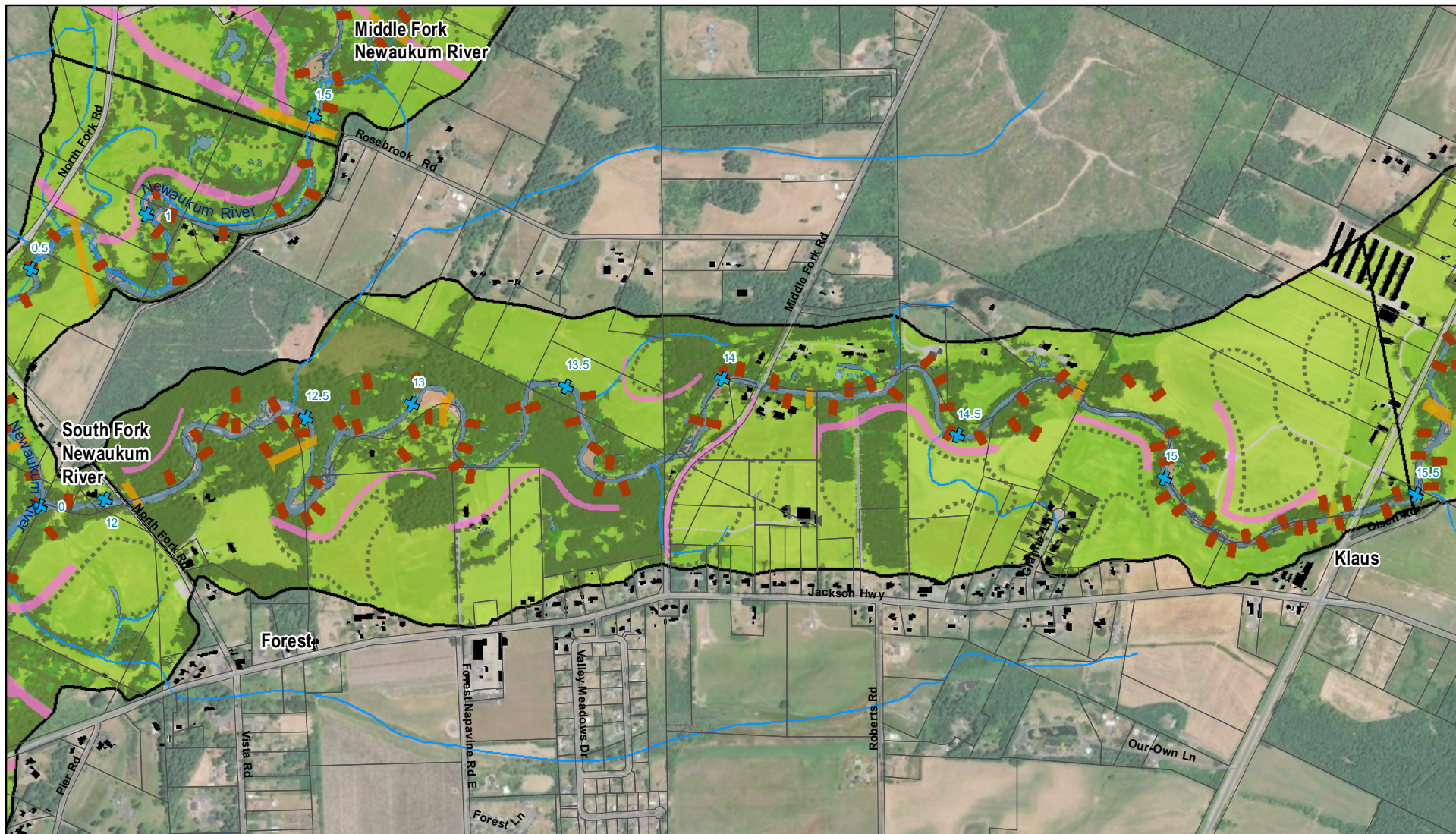


Appendix 3 Mapbook F

Landcover – Highly Engineered- Restorative Flood Protection Concept Design

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Map of Landcover Manning's Values Used for Highly Engineered Restorative Flood Protection Concept Design Hydraulic Model

South Fork Newaukum River - Reach 1

0 250 500 1,000
Feet



Basemap Key

- + River Mile
- Road
- Watercourse
- ▭ River Reach Boundary
- ▭ Parcel Boundary
- ▭ Building

Landcover - Height (Manning's n value)

- | | |
|---|--|
| Vegetation 6' to 12' (0.2) | New Wetland (0.2) |
| Vegetation 12' to 20' (0.1) | Berm (0.15) |
| Vegetation >20' (0.08) | Incision Treatment/ Grade Control Structure (0.15) |
| Vegetated Gravel Bar (0.05) | Engineered Log Jam (0.15) |
| Gravel Bar (0.045) | |
| Log Jam (0.15) | |
| Water (0.035) | |
| Road (0.02) | |
| Structure (building) (0.99) | |

Notes:

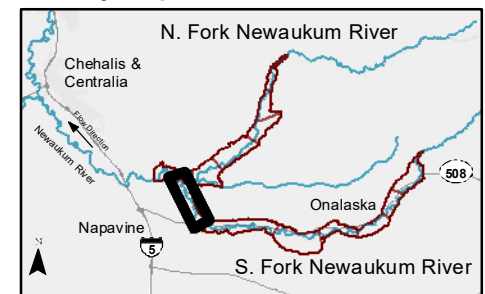
1. Existing landcover vegetation height based off 2017 LiDAR.
2. Numbers in parenthesis for land cover are Manning's n values used for hydraulic modeling.
3. Watercourse dataset from WA Hydrography Dataset.
4. Aerial imagery sourced from ESRI, dates may vary.

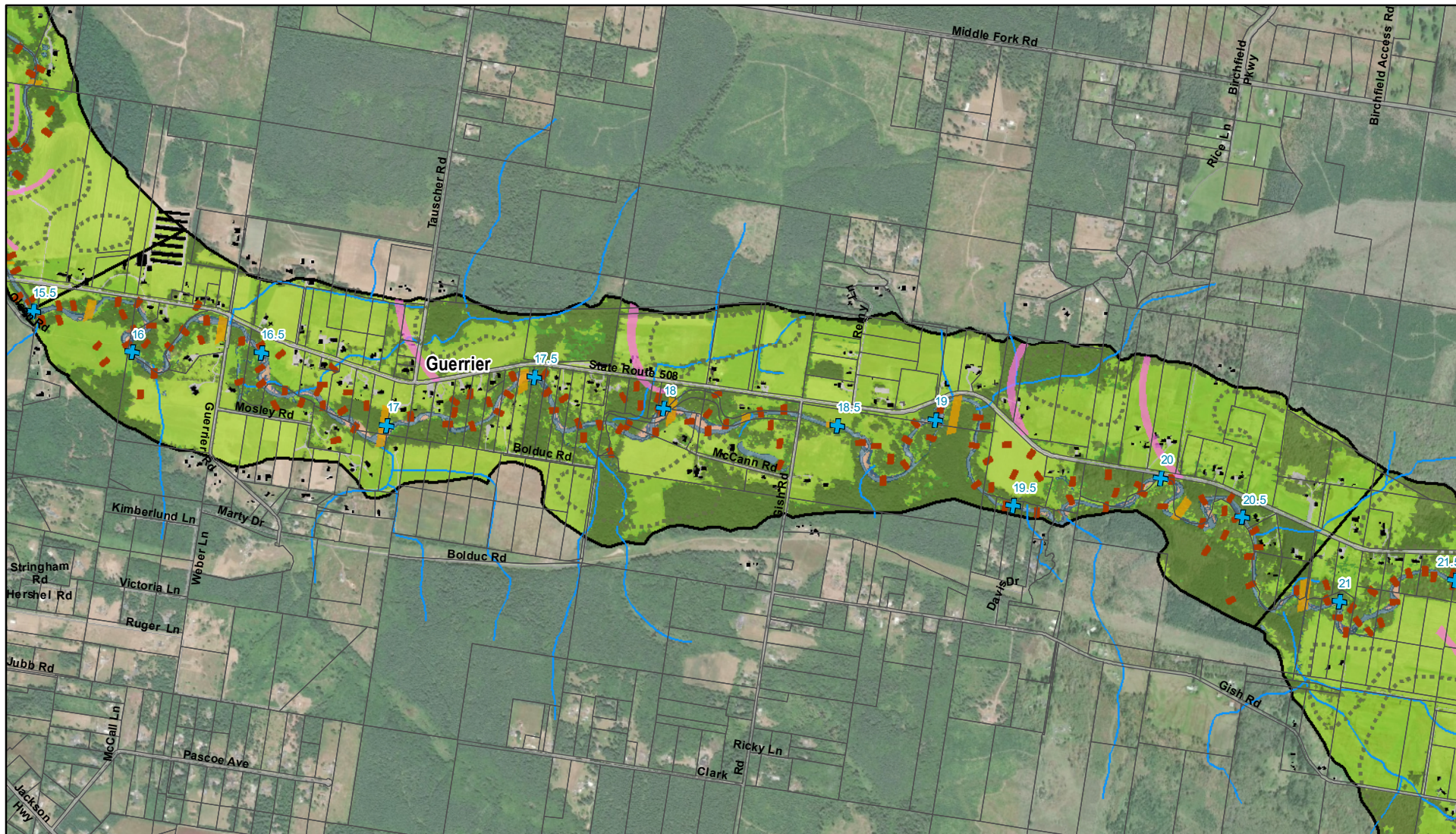
← General Flow Direction

Vicinity Map

0 1 2 4 Miles

▭ Location





Map of Landcover Manning's Values Used for Highly Engineered Restorative Flood Protection Concept Design Hydraulic Model

South Fork Newaukum River - Reach 2

0 250 500 1,000
Feet



Basemap Key

- + River Mile
- Road
- Watercourse
- River Reach Boundary
- Parcel Boundary
- Building

Landcover - Height (Manning's n value)

- | | |
|---|--|
| Vegetation 6' to 12' (0.2) | New Wetland (0.2) |
| Vegetation 12' to 20' (0.1) | Berm (0.15) |
| Vegetation >20' (0.08) | Incision Treatment/ Grade Control Structure (0.15) |
| Vegetated Gravel Bar (0.05) | Engineered Log Jam (0.15) |
| Gravel Bar (0.045) | |
| Log Jam (0.15) | |
| Water (0.035) | |
| Road (0.02) | |
| Structure (building) (0.99) | |

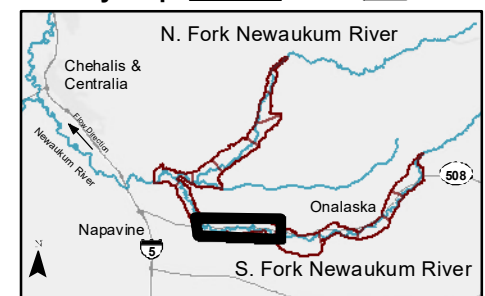
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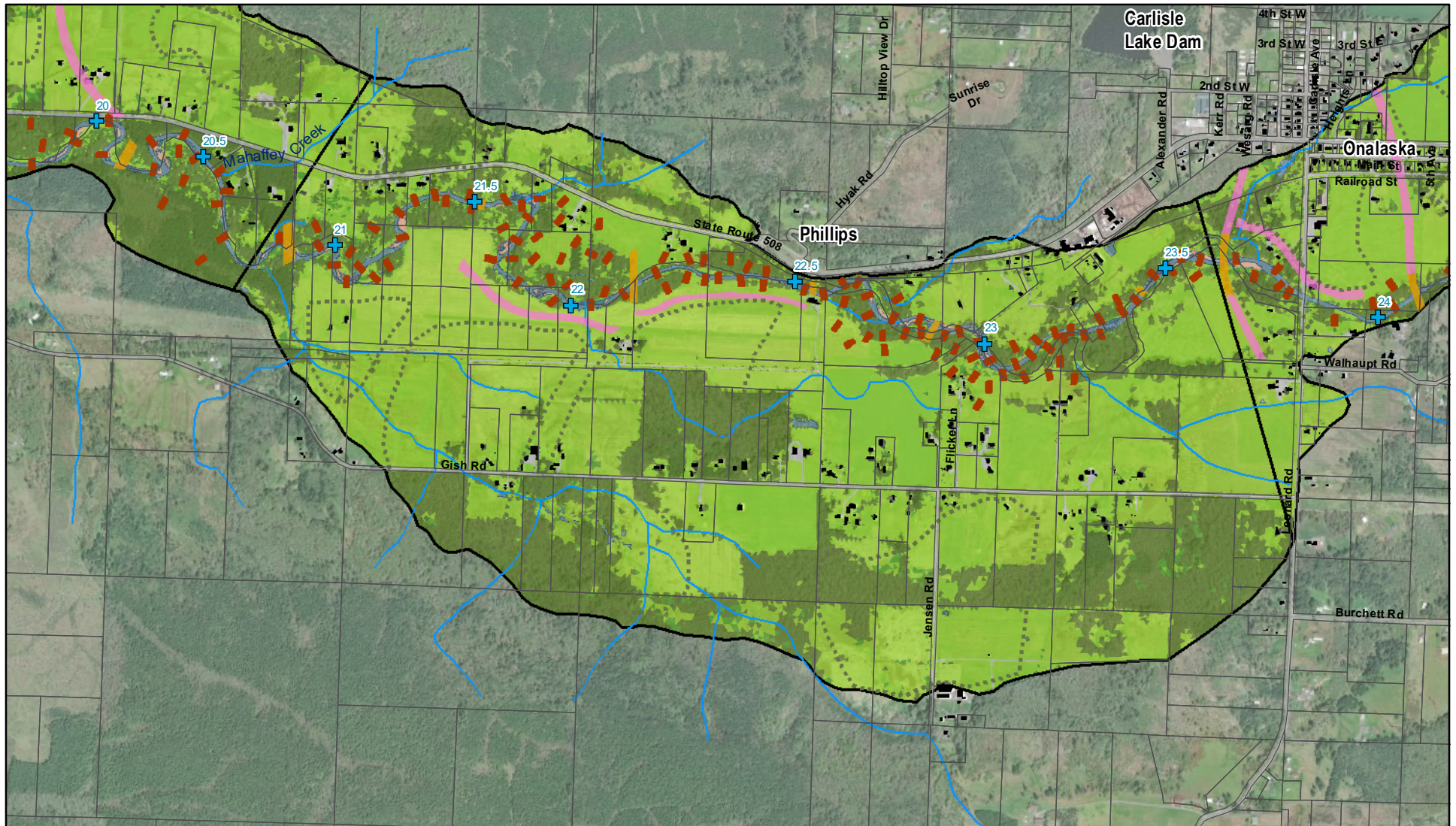
1. Existing landcover vegetation height based off 2017 LiDAR.
2. Numbers in parenthesis for land cover are Manning's n values used for hydraulic modeling.
3. Watercourse dataset from WA Hydrography Dataset.
4. Aerial imagery sourced from ESRI, dates may vary.

Vicinity Map

0 1 2 4 Miles

Location





Map of Landcover Manning's Values Used for Highly Engineered Restorative Flood Protection Concept Design Hydraulic Model

South Fork Newaukum River - Reach 3

0 250 500 1,000
Feet



Basemap Key

- + River Mile
- Road
- Watercourse
- River Reach Boundary
- Parcel Boundary
- Building

Landcover - Height (Manning's n value)

- | | |
|---|--|
| Vegetation 6' to 12' (0.2) | New Wetland (0.2) |
| Vegetation 12' to 20' (0.1) | Berm (0.15) |
| Vegetation >20' (0.08) | Incision Treatment/ Grade Control Structure (0.15) |
| Vegetated Gravel Bar (0.05) | Engineered Log Jam (0.15) |
| Gravel Bar (0.045) | |
| Log Jam (0.15) | |
| Water (0.035) | |
| Road (0.02) | |
| Structure (building) (0.99) | |

Notes:

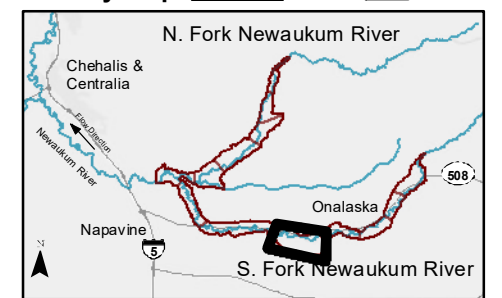
1. Existing landcover vegetation height based off 2017 LiDAR.
2. Numbers in parenthesis for land cover are Manning's n values used for hydraulic modeling.
3. Watercourse dataset from WA Hydrography Dataset.
4. Aerial imagery sourced from ESRI, dates may vary.

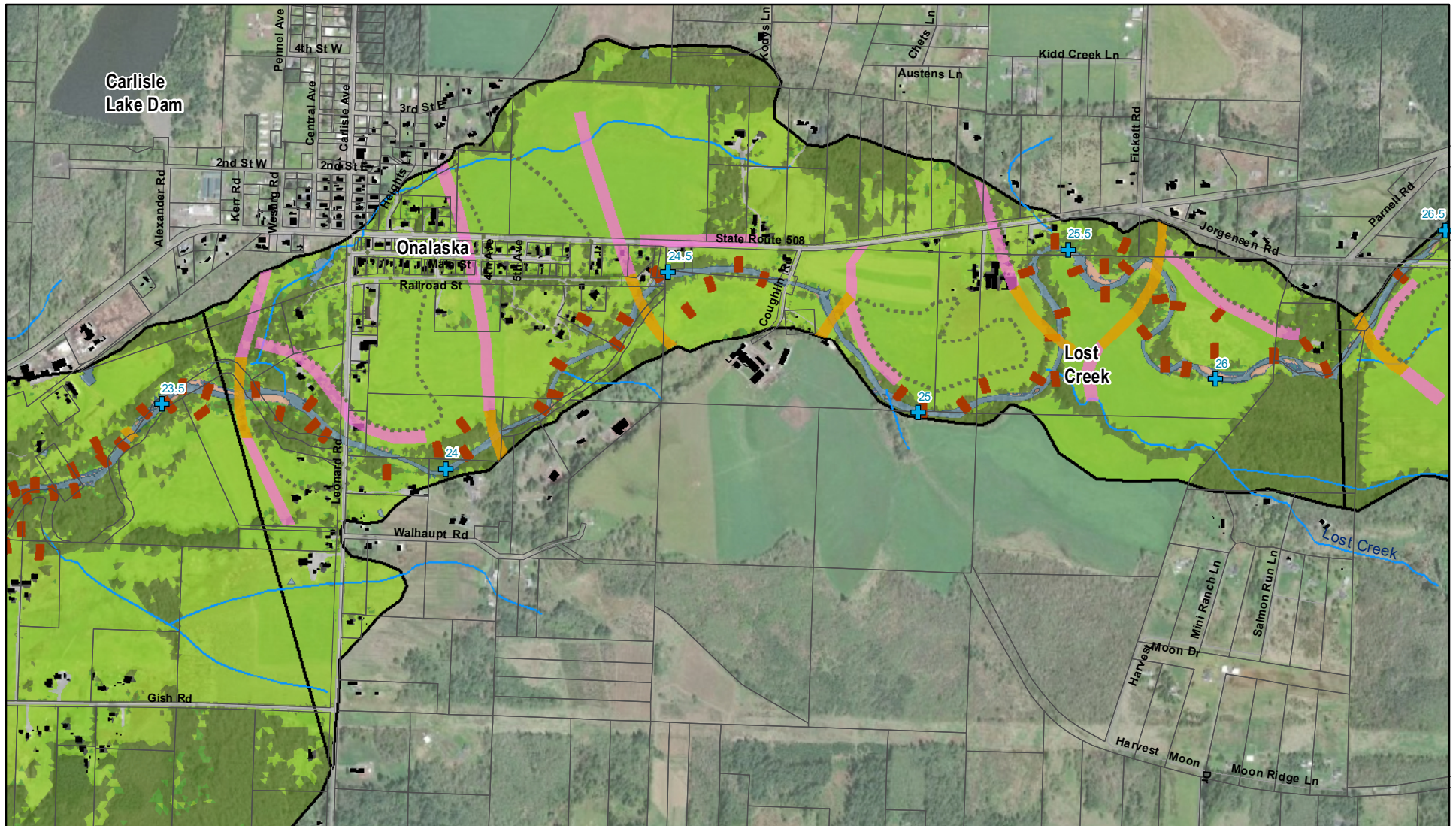
← General Flow Direction

Vicinity Map

0 1 2 4 Miles

Location





Map of Landcover Manning's Values Used for Highly Engineered Restorative Flood Protection Concept Design Hydraulic Model

South Fork Newaukum River - Reach 4

0 250 500 1,000
Feet



Basemap Key

- + River Mile
- Road
- Watercourse
- ▭ River Reach Boundary
- ▭ Parcel Boundary
- ▭ Building

Landcover - Height (Manning's n value)

- | | |
|---|--|
| Vegetation 6' to 12' (0.2) | New Wetland (0.2) |
| Vegetation 12' to 20' (0.1) | Berm (0.15) |
| Vegetation >20' (0.08) | Incision Treatment/ Grade Control Structure (0.15) |
| Vegetated Gravel Bar (0.05) | Engineered Log Jam (0.15) |
| Gravel Bar (0.045) | |
| Log Jam (0.15) | |
| Water (0.035) | |
| Road (0.02) | |
| Structure (building) (0.99) | |

Notes:

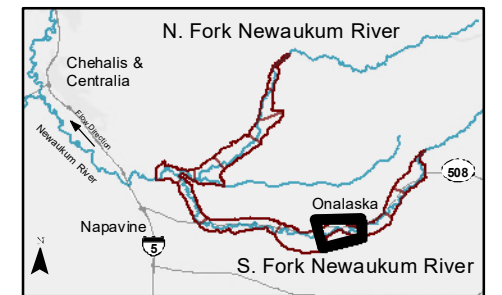
1. Existing landcover vegetation height based off 2017 LiDAR.
2. Numbers in parenthesis for land cover are Manning's n values used for hydraulic modeling.
3. Watercourse dataset from WA Hydrography Dataset.
4. Aerial imagery sourced from ESRI, dates may vary.

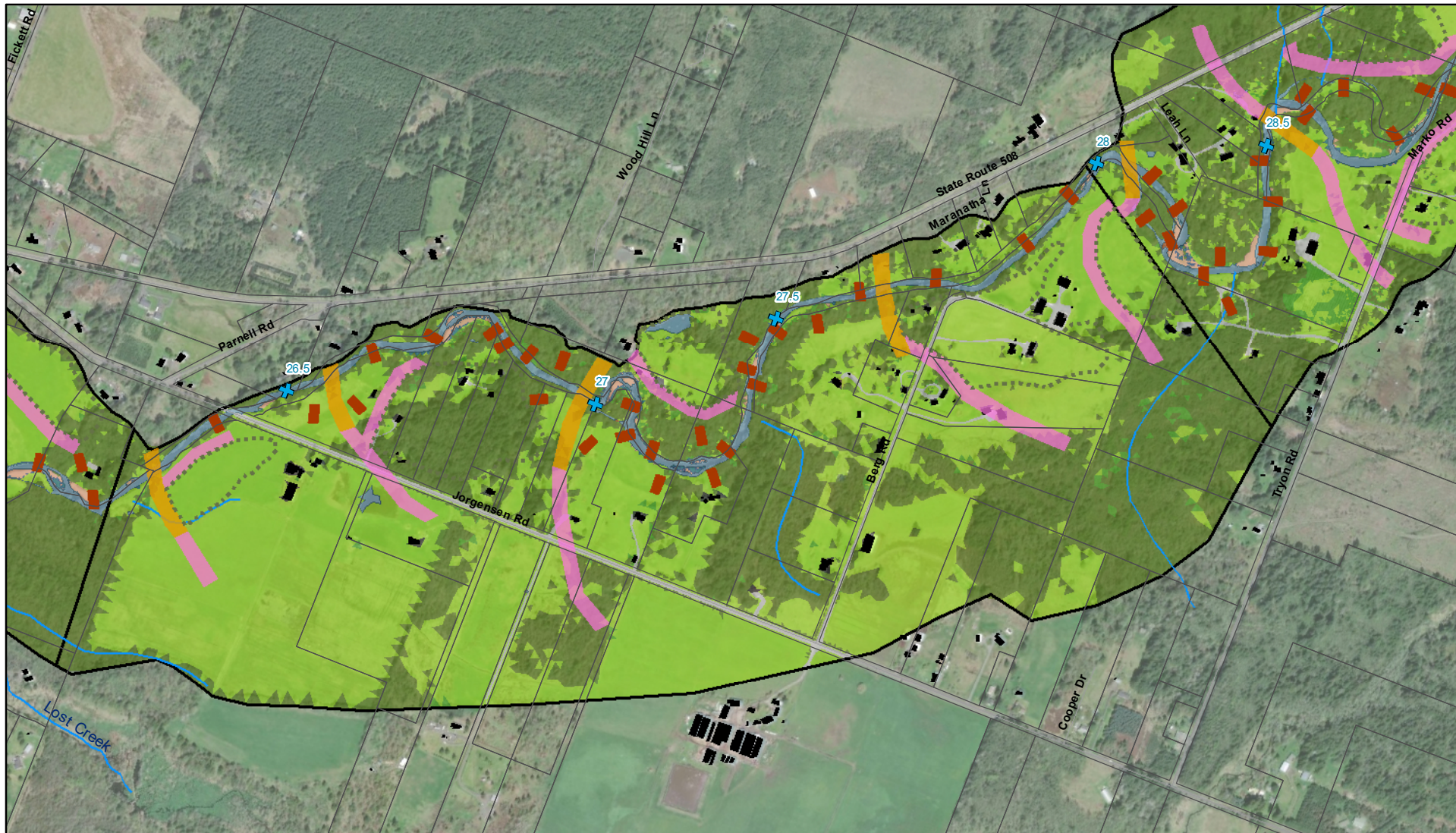
← General Flow Direction

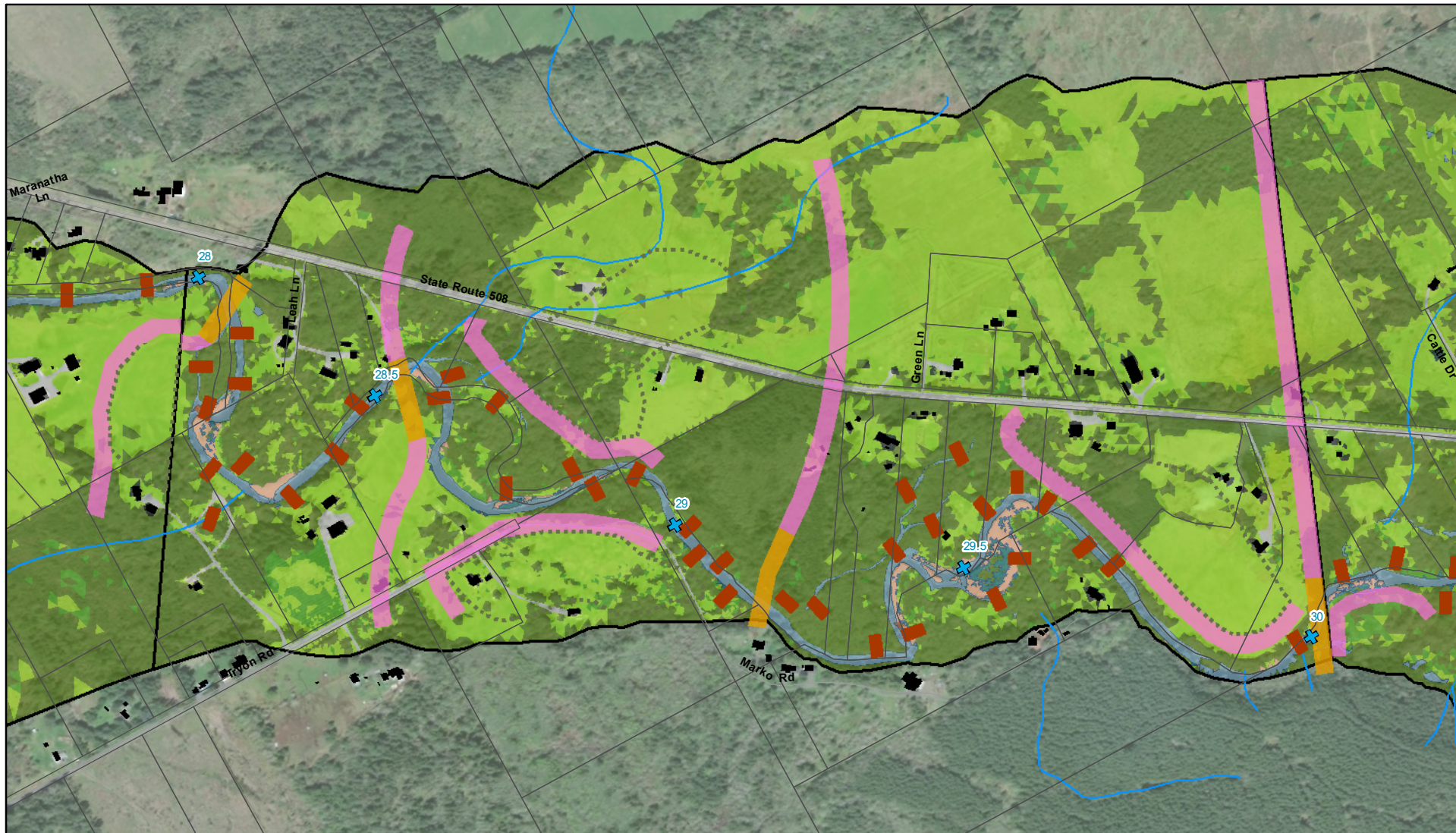
Vicinity Map

0 1 2 4 Miles

▭ Location







Map of Landcover Manning's Values Used for Highly Engineered Restorative Flood Protection Concept Design Hydraulic Model

South Fork Newaukum River - Reach 6

0 250 500 1,000
Feet



Basemap Key

- + River Mile
- Road
- Watercourse
- River Reach Boundary
- Parcel Boundary
- Building

Landcover - Height (Manning's n value)

- | | |
|---|--|
| Vegetation 6' to 12' (0.2) | New Wetland (0.2) |
| Vegetation 12' to 20' (0.1) | Berm (0.15) |
| Vegetation >20' (0.08) | Incision Treatment/ Grade Control Structure (0.15) |
| Vegetated Gravel Bar (0.05) | Engineered Log Jam (0.15) |
| Gravel Bar (0.045) | |
| Log Jam (0.15) | |
| Water (0.035) | |
| Road (0.02) | |
| Structure (building) (0.99) | |

Notes:

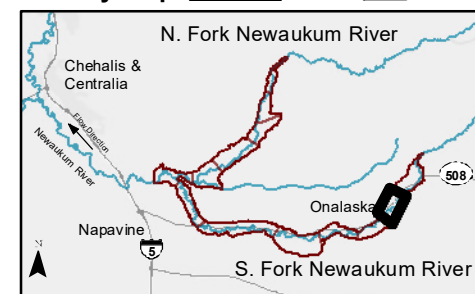
1. Existing landcover vegetation height based off 2017 LiDAR.
2. Numbers in parenthesis for land cover are Manning's n values used for hydraulic modeling.
3. Watercourse dataset from WA Hydrography Dataset.
4. Aerial imagery sourced from ESRI, dates may vary.

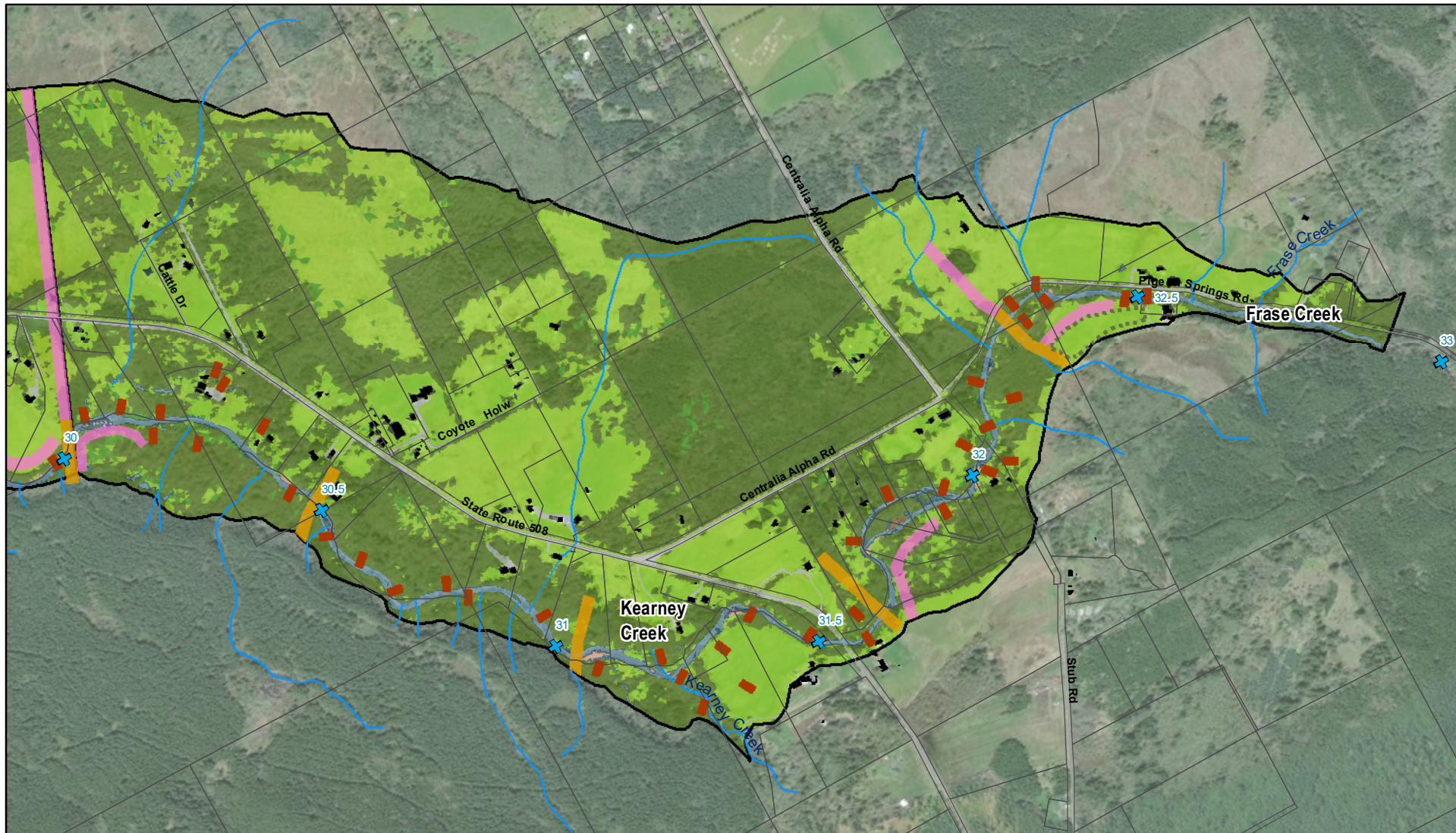
— General Flow Direction

Vicinity Map

0 1 2 4
Miles

Location





Map of Landcover Manning's Values Used for Highly Engineered Restorative Flood Protection Concept Design Hydraulic Model

South Fork Newaukum River - Reach 7

0 250 500 1,000
Feet



Basemap Key

- + River Mile
- Road
- Watercourse
- River Reach Boundary
- Parcel Boundary
- Building

Landcover - Height (Manning's n value)

- | | |
|--|---|
| Vegetation 6' to 12' (0.2) | New Wetland (0.2) |
| Vegetation 12' to 20' (0.1) | Berm (0.15) |
| Vegetation >20' (0.08) | Incision Treatment/ Grade Control Structure (0.15) |
| Vegetated Gravel Bar (0.05) | Engineered Log Jam (0.15) |
| Gravel Bar (0.045) | |
| Log Jam (0.15) | |
| Water (0.035) | |
| Road (0.02) | |
| Structure (building) (0.99) | |

Notes:

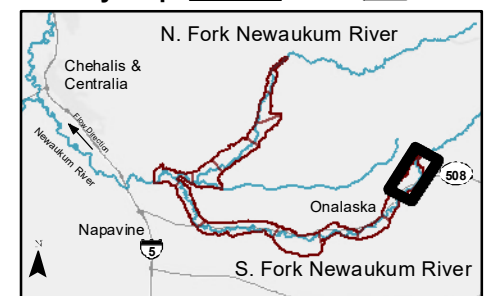
1. Existing landcover vegetation height based off 2017 LiDAR.
2. Numbers in parenthesis for land cover are Manning's n values used for hydraulic modeling.
3. Watercourse dataset from WA Hydrography Dataset.
4. Aerial imagery sourced from ESRI, dates may vary.

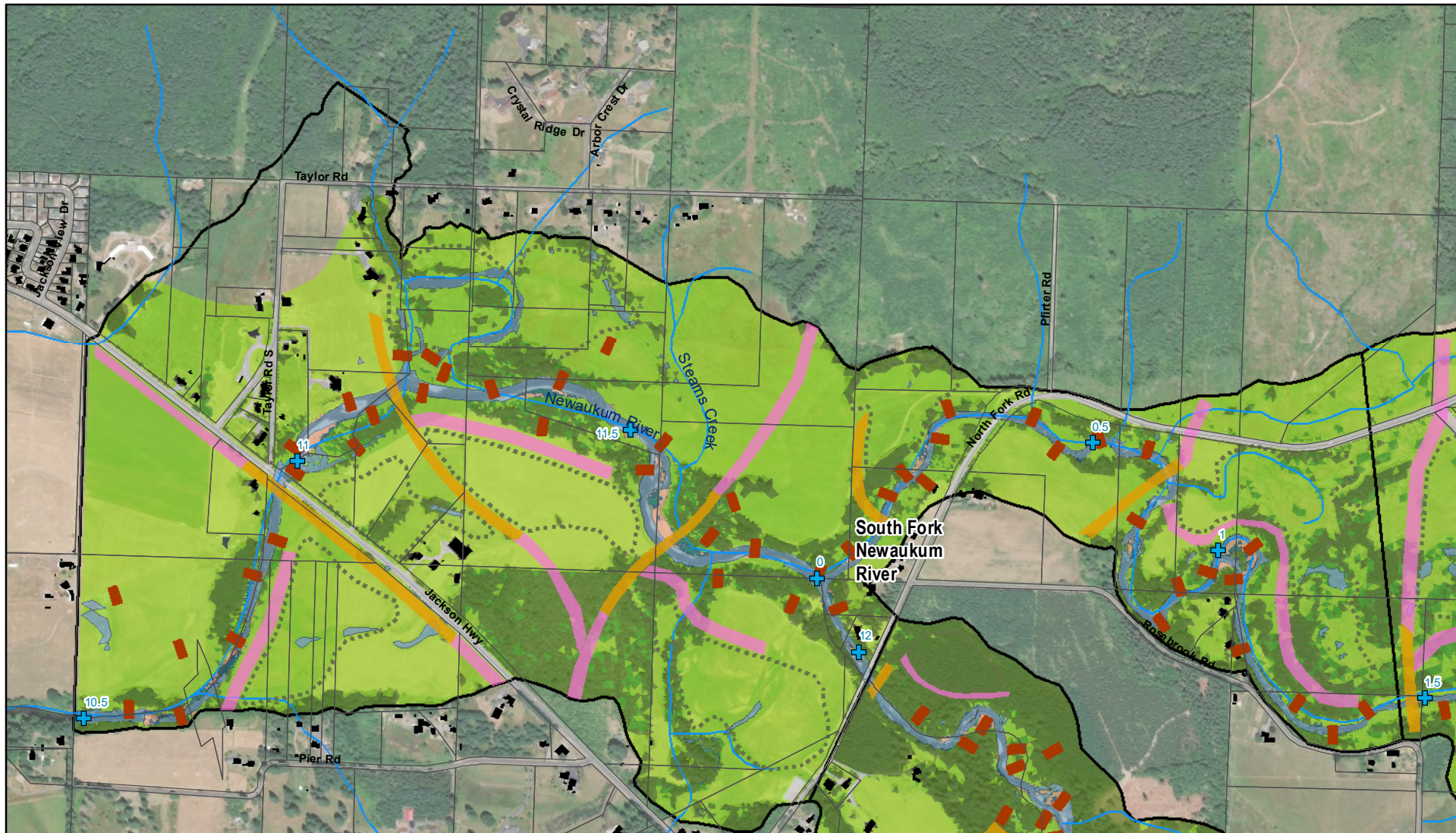
← General Flow Direction

Vicinity Map

0 1 2 4 Miles

 Location





Map of Landcover Manning's Values Used for Highly Engineered Restorative Flood Protection Concept Design Hydraulic Model

North Fork Newaukum River - Reach 1

0 250 500 1,000
Feet



Basemap Key

- + River Mile
- Road
- Watercourse
- ▭ River Reach Boundary
- ▭ Parcel Boundary
- ▭ Building

Landcover - Height (Manning's n value)

- | | |
|---|--|
| Vegetation 6' to 12' (0.2) | New Wetland (0.2) |
| Vegetation 12' to 20' (0.1) | Berm (0.15) |
| Vegetation >20' (0.08) | Incision Treatment/ Grade Control Structure (0.15) |
| Vegetated Gravel Bar (0.05) | Engineered Log Jam (0.15) |
| Gravel Bar (0.045) | |
| Log Jam (0.15) | |
| Water (0.035) | |
| Road (0.02) | |
| Structure (building) (0.99) | |

Notes:

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2. Numbers in parenthesis for land cover are Manning's n values used for hydraulic modeling.
3. Watercourse dataset from WA Hydrography Dataset.
4. Aerial imagery sourced from ESRI, dates may vary.

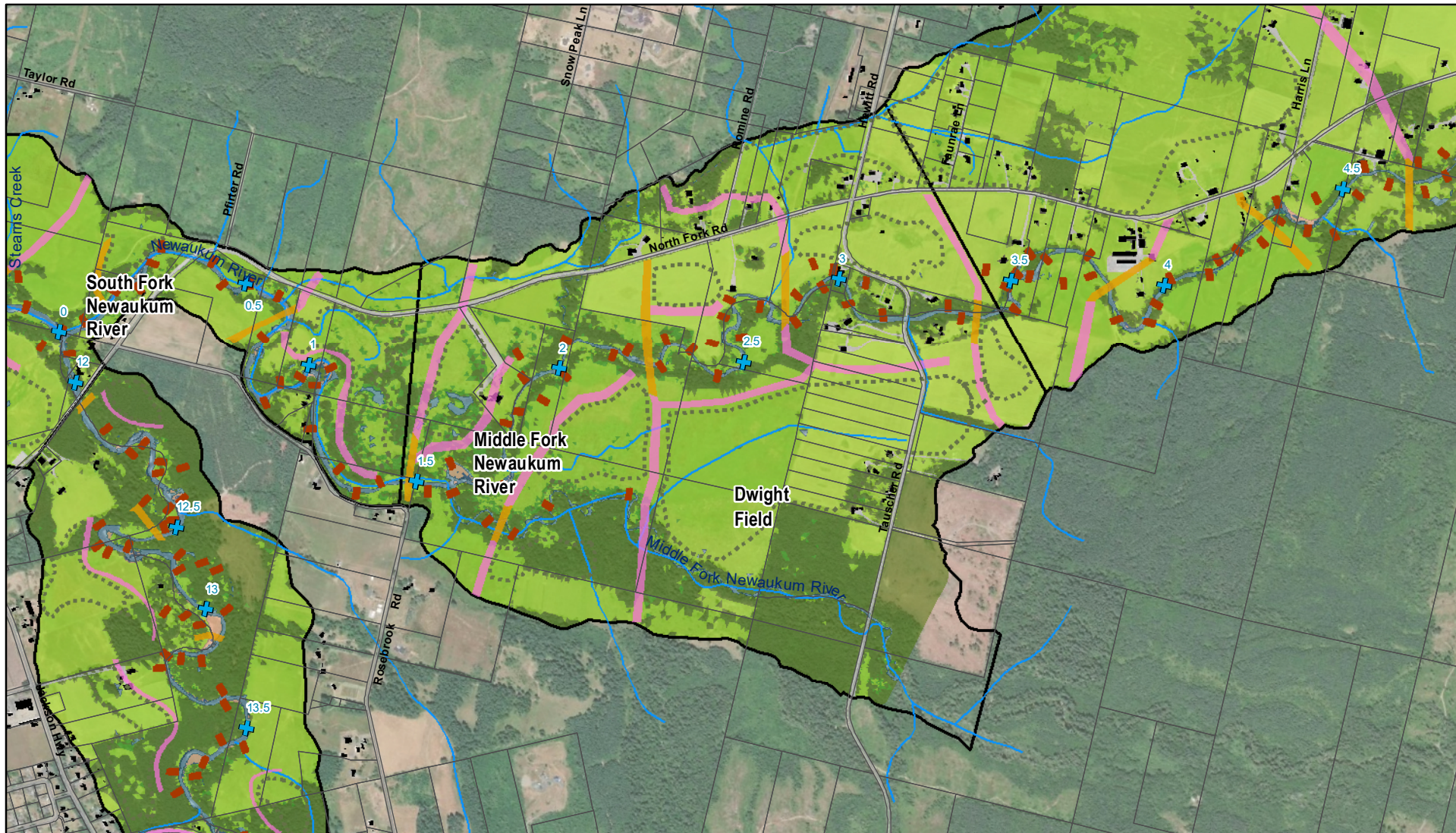
← General Flow Direction

Vicinity Map

0 1 2 4
Miles

▭ Location





Map of Landcover Manning's Values Used for Highly Engineered Restorative Flood Protection Concept Design Hydraulic Model

North Fork Newaukum River - Reach 2

0 250 500 1,000
Feet



Basemap Key

- + River Mile
- Road
- Watercourse
- River Reach Boundary
- Parcel Boundary
- Building

Landcover - Height (Manning's n value)

- | | |
|---|--|
| Vegetation 6' to 12' (0.2) | New Wetland (0.2) |
| Vegetation 12' to 20' (0.1) | Berm (0.15) |
| Vegetation >20' (0.08) | Incision Treatment/ Grade Control Structure (0.15) |
| Vegetated Gravel Bar (0.05) | Engineered Log Jam (0.15) |
| Gravel Bar (0.045) | |
| Log Jam (0.15) | |
| Water (0.035) | |
| Road (0.02) | |
| Structure (building) (0.99) | |

Notes:

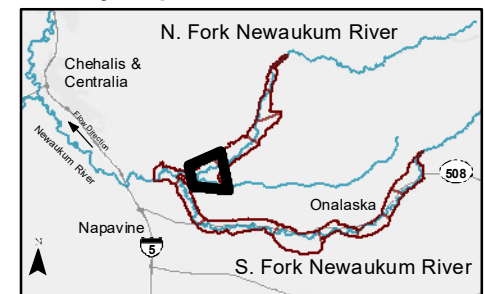
1. Existing landcover vegetation height based off 2017 LiDAR.
2. Numbers in parenthesis for land cover are Manning's n values used for hydraulic modeling.
3. Watercourse dataset from WA Hydrography Dataset.
4. Aerial imagery sourced from ESRI, dates may vary.

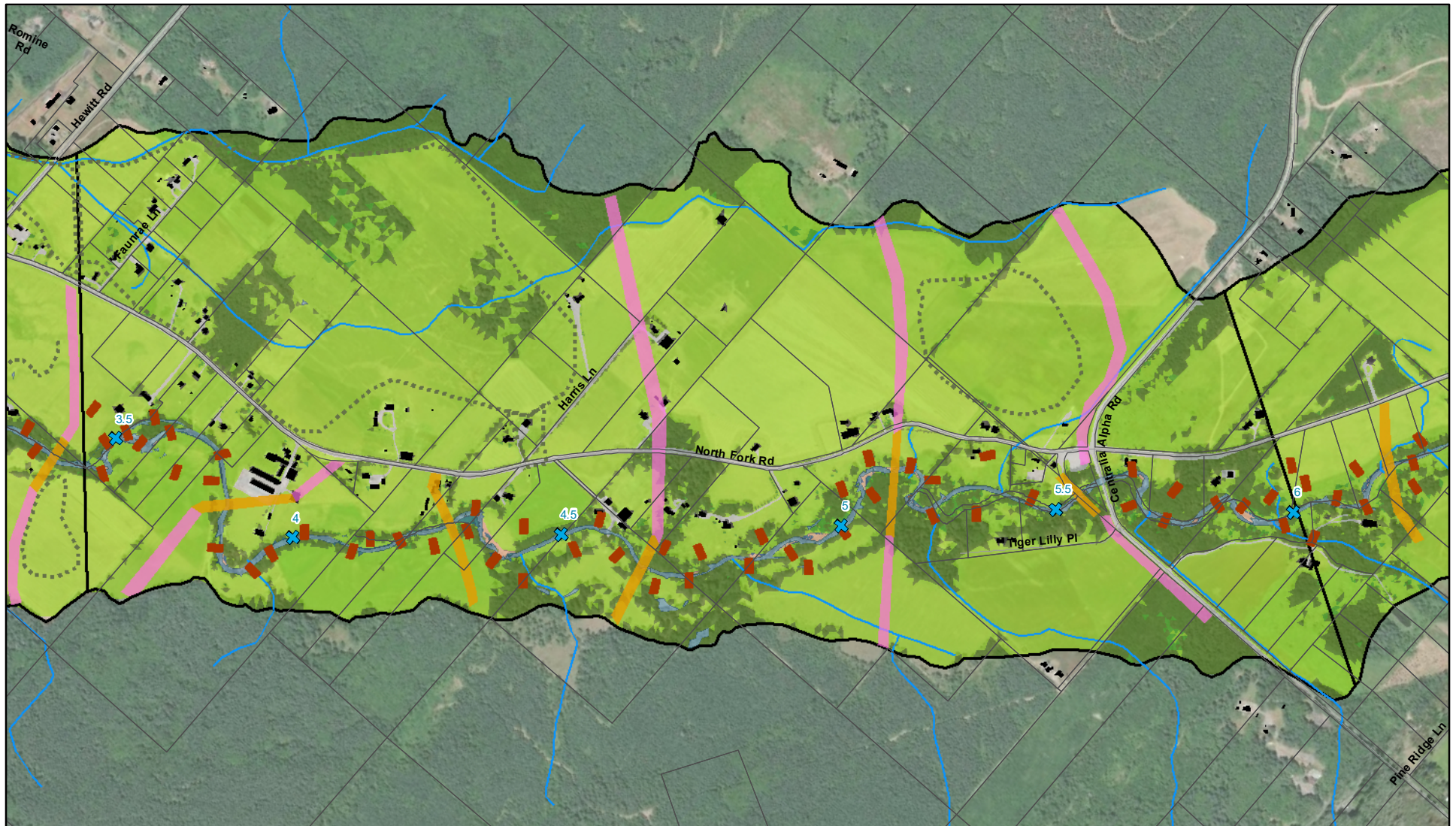
← General Flow Direction

Vicinity Map

0 1 2 4 Miles

Location





Map of Landcover Manning's Values Used for Highly Engineered Restorative Flood Protection Concept Design Hydraulic Model

North Fork Newaukum River - Reach 3

0 250 500 1,000
Feet



Basemap Key

- + River Mile
- Road
- Watercourse
- ▬ River Reach Boundary
- ▬ Parcel Boundary
- Building

Landcover - Height (Manning's n value)

- | | |
|---|--|
| Vegetation 6' to 12' (0.2) | New Wetland (0.2) |
| Vegetation 12' to 20' (0.1) | Berm (0.15) |
| Vegetation >20' (0.08) | Incision Treatment/ Grade Control Structure (0.15) |
| Vegetated Gravel Bar (0.05) | Engineered Log Jam (0.15) |
| Gravel Bar (0.045) | |
| Log Jam (0.15) | |
| Water (0.035) | |
| Road (0.02) | |
| Structure (building) (0.99) | |

Notes:

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3. Watercourse dataset from WA Hydrography Dataset.
4. Aerial imagery sourced from ESRI, dates may vary.

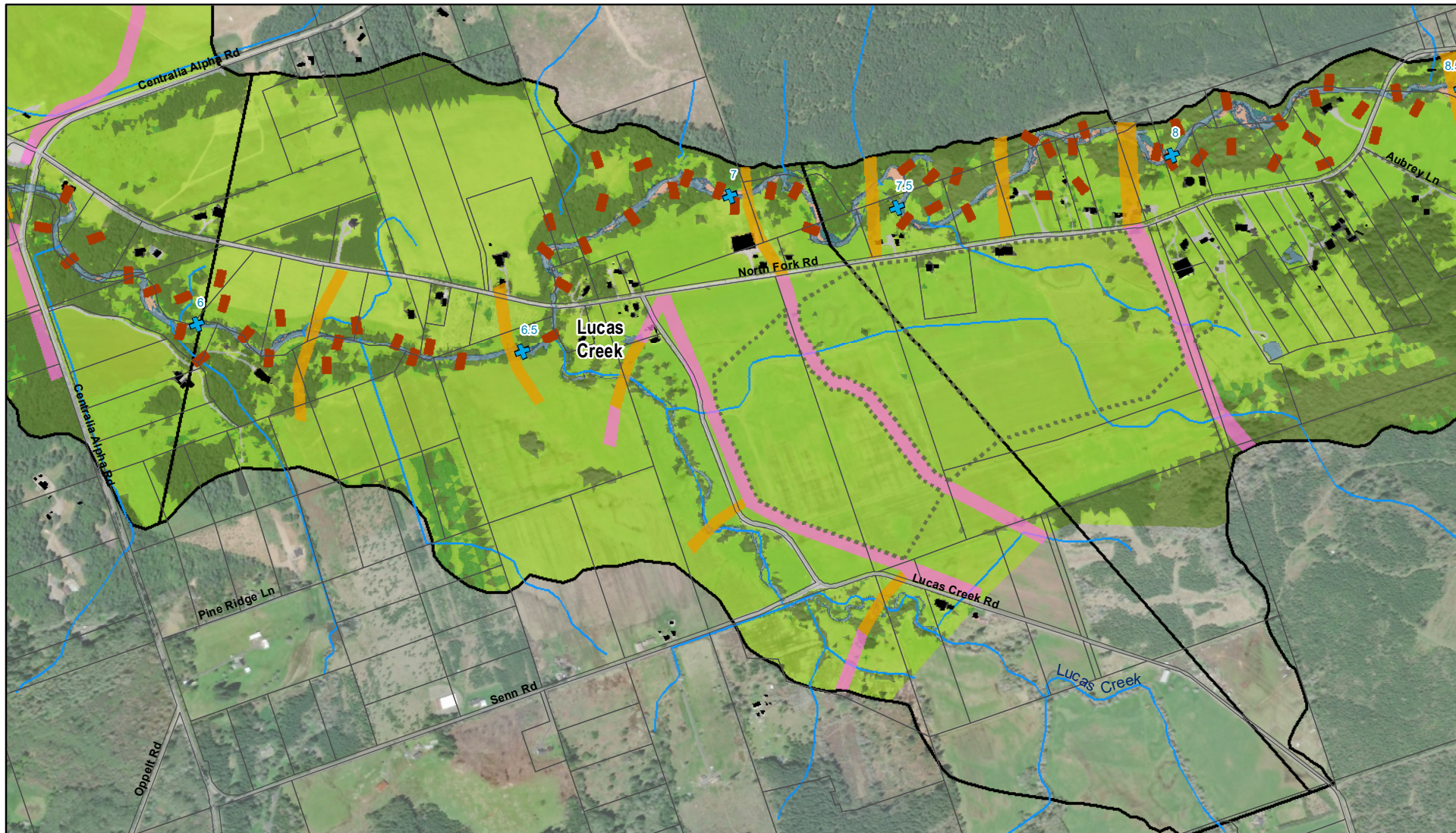
General Flow Direction

Vicinity Map

0 1 2 4 Miles

Location





Map of Landcover Manning's Values Used for Highly Engineered Restorative Flood Protection Concept Design Hydraulic Model

North Fork Newaukum River - Reach 4

0 250 500 1,000
Feet



Basemap Key

- + River Mile
- Road
- Watercourse
- ▭ River Reach Boundary
- ▭ Parcel Boundary
- ▭ Building

Landcover - Height (Manning's n value)

- | | |
|---|--|
| Vegetation 6' to 12' (0.2) | New Wetland (0.2) |
| Vegetation 12' to 20' (0.1) | Berm (0.15) |
| Vegetation >20' (0.08) | Incision Treatment/ Grade Control Structure (0.15) |
| Vegetated Gravel Bar (0.05) | Engineered Log Jam (0.15) |
| Gravel Bar (0.045) | |
| Log Jam (0.15) | |
| Water (0.035) | |
| Road (0.02) | |
| Structure (building) (0.99) | |

Notes:

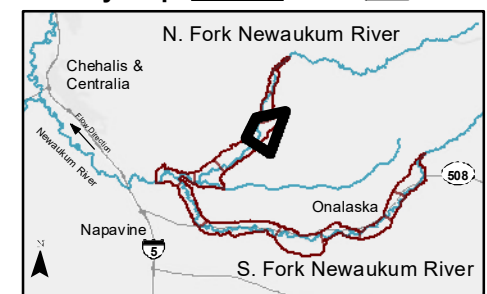
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3. Watercourse dataset from WA Hydrography Dataset.
4. Aerial imagery sourced from ESRI, dates may vary.

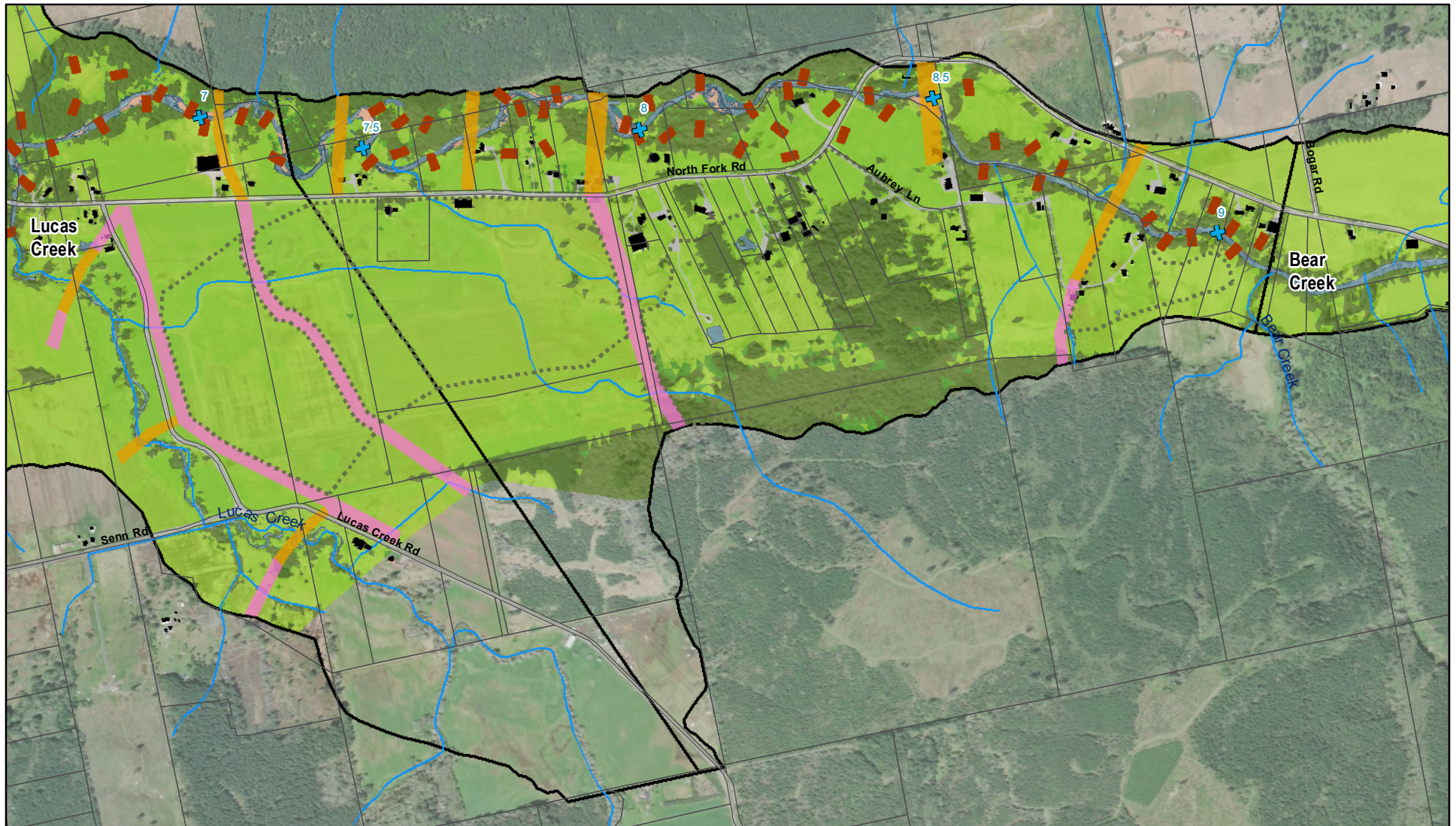
← General Flow Direction

Vicinity Map

0 1 2 4 Miles

▭ Location





Map of Landcover Manning's Values Used for Highly Engineered Restorative Flood Protection Concept Design Hydraulic Model

North Fork Newaukum River - Reach 5

0 250 500 1,000
Feet



Basemap Key

- River Mile
- Road
- Watercourse
- River Reach Boundary
- Parcel Boundary
- Building

Landcover - Height (Manning's n value)

- | | |
|-----------------------------|--|
| Vegetation 6' to 12' (0.2) | New Wetland (0.2) |
| Vegetation 12' to 20' (0.1) | Berm (0.15) |
| Vegetation >20' (0.08) | Incision Treatment/ Grade Control Structure (0.15) |
| Vegetated Gravel Bar (0.05) | Engineered Log Jam (0.15) |
| Gravel Bar (0.045) | |
| Log Jam (0.15) | |
| Water (0.035) | |
| Road (0.02) | |
| Structure (building) (0.99) | |

Notes:

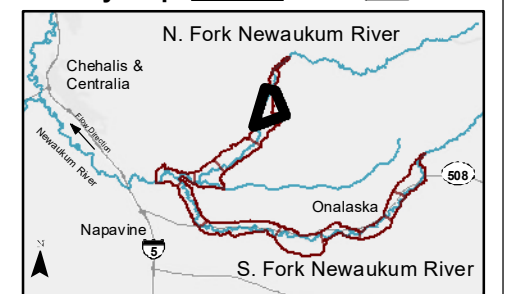
1. Existing landcover vegetation height based off 2017 LiDAR.
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3. Watercourse dataset from WA Hydrography Dataset.
4. Aerial imagery sourced from ESRI, dates may vary.

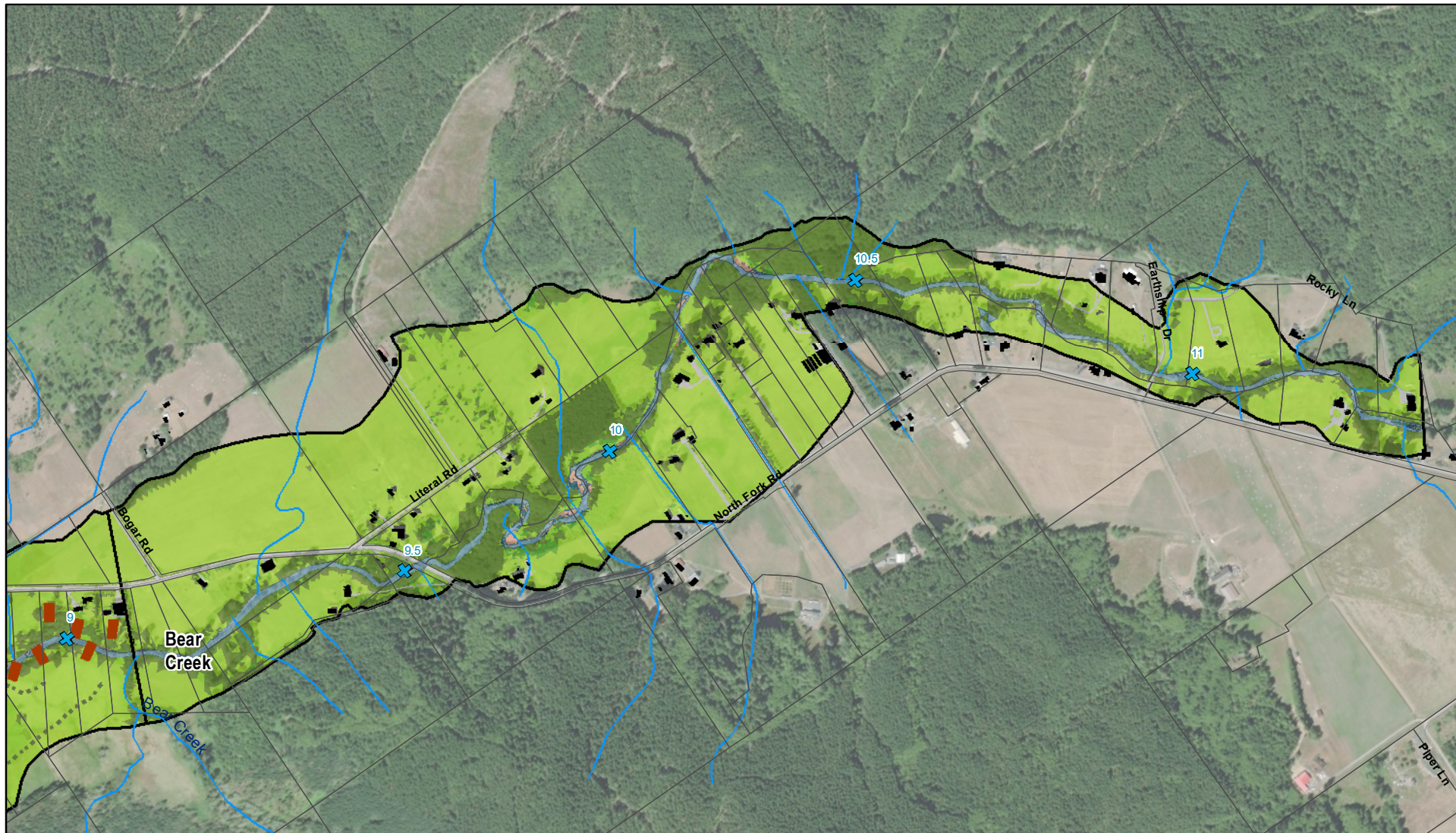
General Flow Direction

Vicinity Map

0 1 2 4
Miles

Location





Map of Landcover Manning's Values Used for Highly Engineered Restorative Flood Protection Concept Design Hydraulic Model

North Fork Newaukum River - Reach 6

0 250 500 1,000
Feet



Basemap Key

- + River Mile
- Road
- Watercourse
- River Reach Boundary
- Parcel Boundary
- Building

Landcover - Height (Manning's n value)

- Vegetation 6' to 12' (0.2)
- Vegetation 12' to 20' (0.1)
- Vegetation >20' (0.08)
- Vegetated Gravel Bar (0.05)
- Gravel Bar (0.045)
- Water (0.035)
- Road (0.02)
- Structure (building) (0.99)
- New Wetland (0.2)
- Engineered Log Jam (0.15)

Notes:

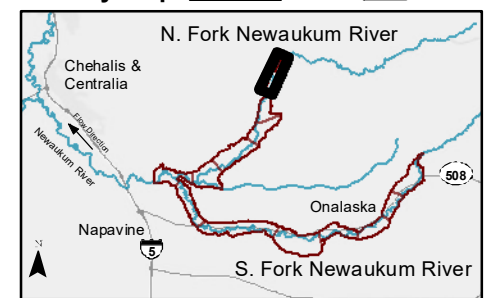
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3. Watercourse dataset from WA Hydrography Dataset.
4. Aerial imagery sourced from ESRI, dates may vary.

← General Flow Direction

Vicinity Map

0 1 2 4 Miles

 Location



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