

PART A - APPENDIX D: MIDDLE RIVER MAINSTEM  
SURVEYS, 2013

**Susitna-Watana Hydroelectric Project  
(FERC No. 14241)**

**Characterization and Mapping of Aquatic  
Habitats (9.9)**

**Part A - Appendix D  
Middle River Mainstem Surveys, 2013**

**Initial Study Report**

Prepared for

Alaska Energy Authority



**SUSITNA-WATANA HYDRO**

*Clean, reliable energy for the next 100 years.*

Prepared by

R2 Resource Consultants, Inc.

June 2014



- Legend**
- Instream Flow Focus Area (Upper and Lower Extent)
  - Project River Mile
  - ← Flow Arrow

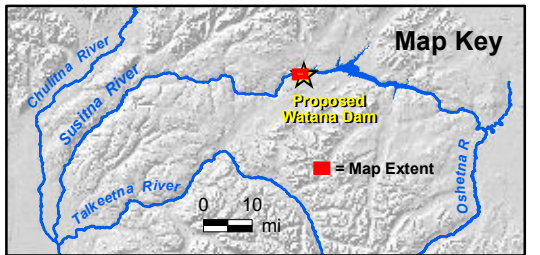
- Macrohabitat (2013)\***
- Main Channel
  - Split Main Channel
  - - - - Multiple Split Main Channel
  - Side Channel
  - Side Slough
  - Upland Slough
- Mesohabitat (2013)\***
- - - - Riffle
  - - - - Run
  - Glide
  - Pool
  - Backwater
  - Clearwater Plume

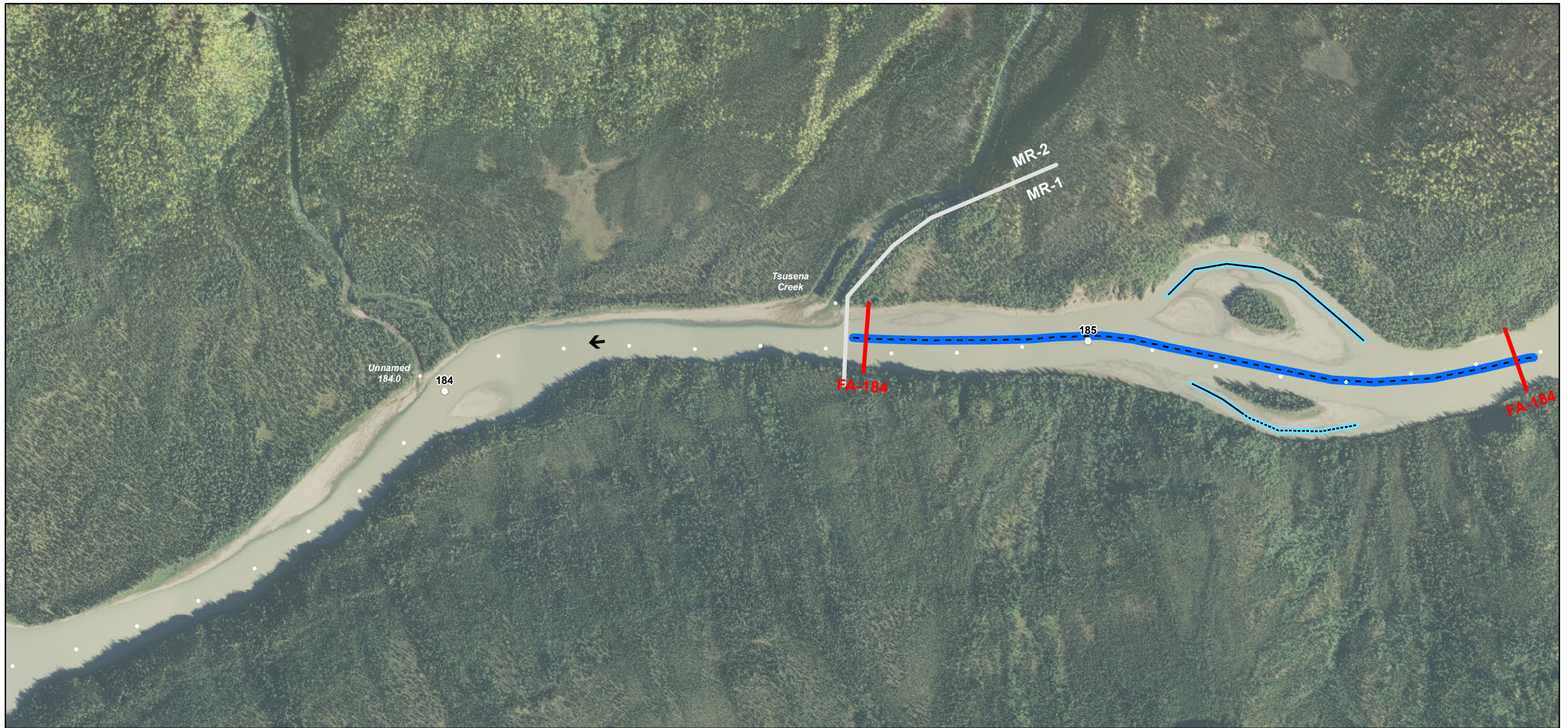
- Dry
  - Beaver Complex
- \* Preliminary Data

Orthophoto Source: 2011 Matanuska-Susitna Borough LiDAR & Imagery Project



Projection: AK SP Zone 4 NAD 1983  
 Date Created: 1/29/2014  
 Map Author: R2 - Joetta Zabolney  
 File: Map\_ISR\_FA\_AQHAB\_MS.mxd





- Legend**
- Instream Flow Focus Area (Upper and Lower Extent)
  - Project River Mile
  - ← Flow Arrow

- |   |  |  |  |
|---|--|--|--|
| <b>Macrohabitat (2013)*</b>   |  | <b>Mesohabitat (2013)*</b>                           |  |
| <span style="color: blue;">—</span> Main Channel                        | <span style="color: blue;">- - -</span> Riffle       | <span style="color: brown;">—</span> Dry             |  |
| <span style="color: blue;">- - -</span> Split Main Channel              | <span style="color: black;">- - -</span> Run         | <span style="color: orange;">—</span> Beaver Complex |  |
| <span style="color: blue;">- - - - -</span> Multiple Split Main Channel | <span style="color: black;">—</span> Glide           |  |  |
| <span style="color: lightblue;">—</span> Side Channel                   | <span style="color: red;">—</span> Pool              |  |  |
| <span style="color: lightgreen;">—</span> Side Slough                   | <span style="color: grey;">—</span> Backwater        |  |  |
| <span style="color: yellow;">—</span> Upland Slough                     | <span style="color: pink;">—</span> Clearwater Plume |  |  |
- \* Preliminary Data

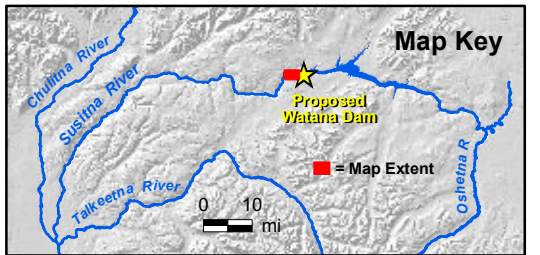
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**ALASKA ENERGY AUTHORITY**

0 1,000 Feet

0 10 mi

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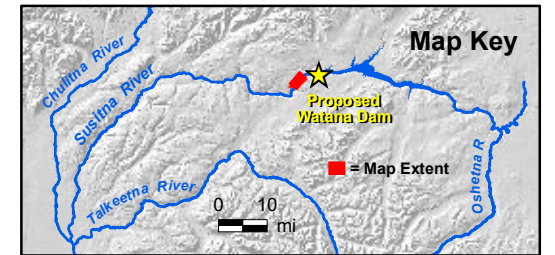
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**Legend**

- Instream Flow Focus Area (Upper and Lower Extent)
- Project River Mile
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**Macrohabitat (2013)\***

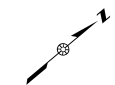
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- Multiple Split Main Channel
- Side Channel
- Side Slough
- Upland Slough

**Mesohabitat (2013)\***

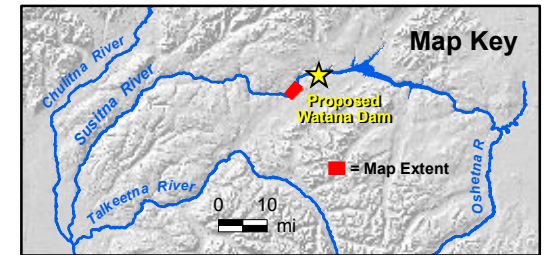
- Riffle
- Run
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- Pool
- Backwater
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

**Legend**



-  Instream Flow Focus Area (Upper and Lower Extent)
-  Project River Mile
-  Flow Arrow

**Macrohabitat (2013)\***

-  Main Channel
-  Split Main Channel
-  Multiple Split Main Channel
-  Side Channel
-  Side Slough
-  Upland Slough

**Mesohabitat (2013)\***

-  Riffle
-  Run
-  Glide
-  Pool
-  Backwater
-  Clearwater Plume

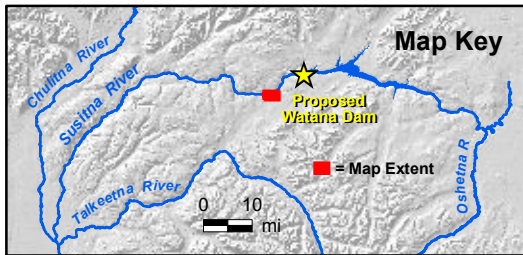
-  Dry
-  Beaver Complex

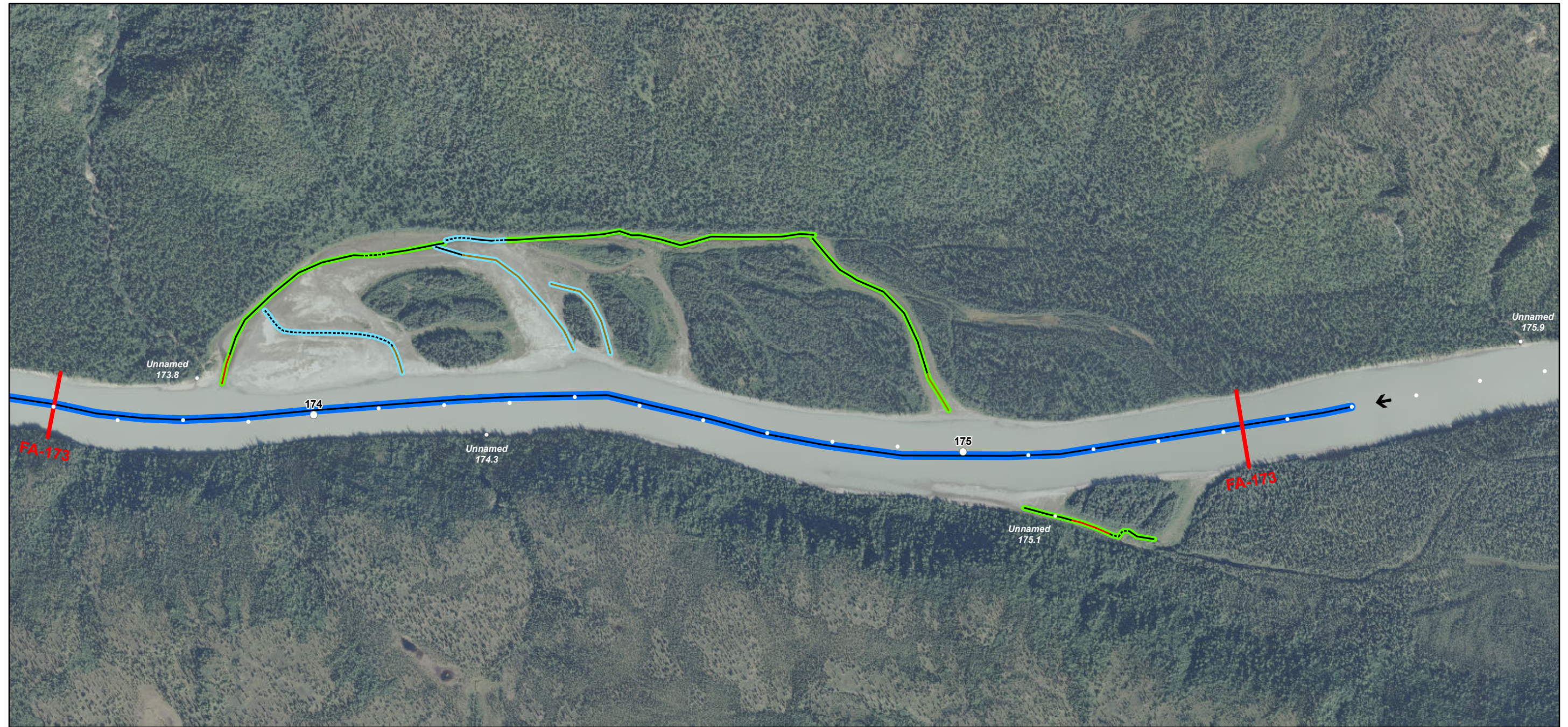
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	Flow Arrow

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	Main Channel
	Split Main Channel
	Multiple Split Main Channel
	Side Channel
	Side Slough
	Upland Slough

**Mesohabitat (2013)\***

	Riffle		Dry
	Run		Beaver Complex
	Glide		
	Pool		
	Backwater		
	Clearwater Plume		

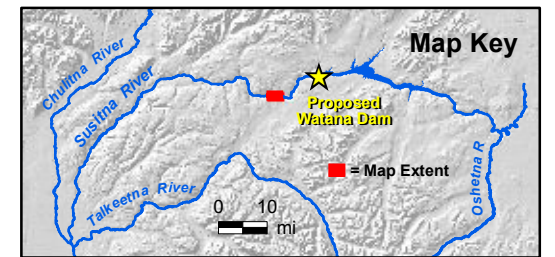
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**ALASKA ENERGY AUTHORITY**

0 1,000 Feet

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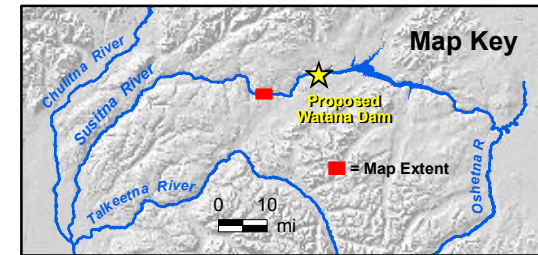
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**Legend**

	Instream Flow Focus Area (Upper and Lower Extent)
	Project River Mile
	Flow Arrow

**Macrohabitat (2013)\***

	Main Channel
	Split Main Channel
	Multiple Split Main Channel
	Side Channel
	Side Slough
	Upland Slough

**Mesohabitat (2013)\***

	Riffle		Dry
	Run		Beaver Complex
	Glide		
	Pool		
	Backwater		
	Clearwater Plume		

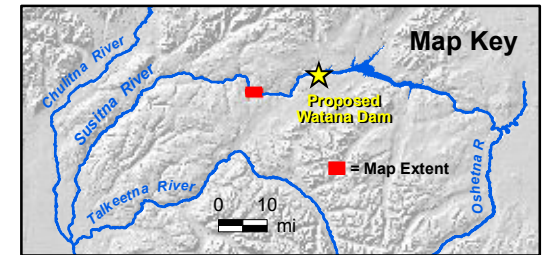
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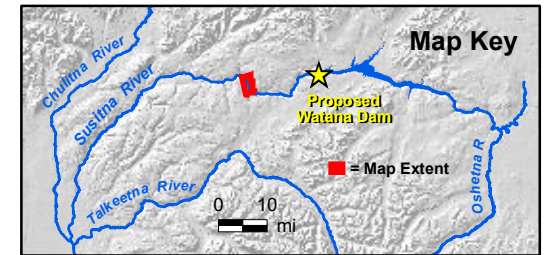
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  - Glide
  - Pool
  - Backwater
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0 1,000 Feet

0 10 mi

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 File: Map\_ISR\_FA\_AQHAB\_MSP9.mxd



Orthophoto Source: 2011 Matanuska-Susitna Borough LiDAR & Imagery Project



**Legend**

- █ Instream Flow Focus Area (Upper and Lower Extent)
- Project River Mile
- ← Flow Arrow

**Macrohabitat (2013)\***

- █ Main Channel
- ▬ Split Main Channel
- ▬▬▬▬ Multiple Split Main Channel
- ▬ Side Channel
- ▬ Side Slough
- ▬ Upland Slough

**Mesohabitat (2013)\***

- - - - - Riffle
- - - - - Run
- ▬ Glide
- ▬ Pool
- ▬ Backwater
- ▬ Clearwater Plume

- ▬ Dry
- ▬ Beaver Complex

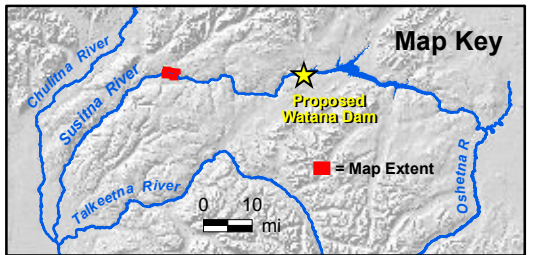
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0 1,000 Feet

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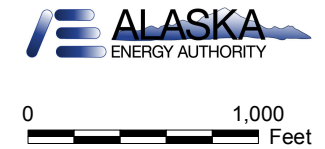


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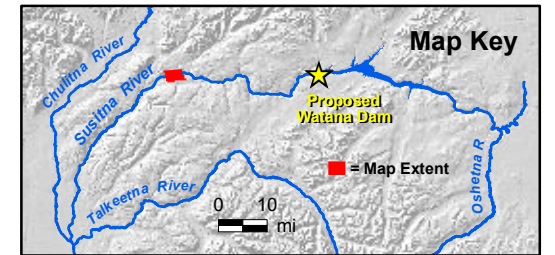
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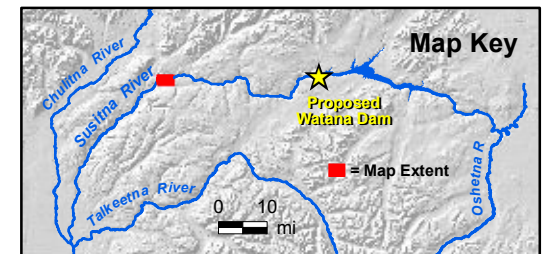
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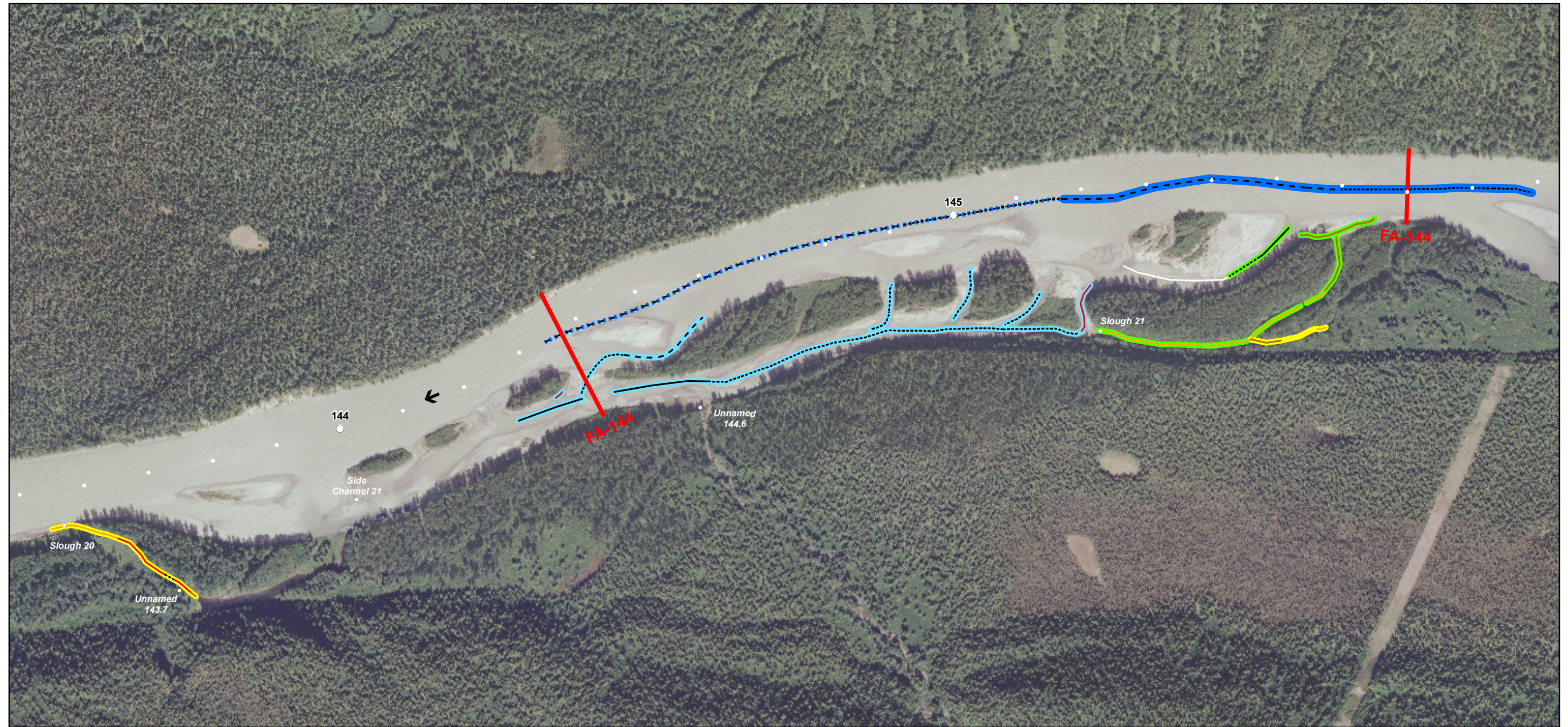
- |   |  |  |
|---|--|--|
| <b>Macrohabitat (2013)*</b>   | <b>Mesohabitat (2013)*</b>                           |  |
| <span style="color: blue;">—</span> Main Channel                    | <span style="color: blue;">- - -</span> Riffle       | <span style="color: orange;">—</span> Dry            |
| <span style="color: blue;">—</span> Split Main Channel              | <span style="color: black;">- - -</span> Run         | <span style="color: yellow;">—</span> Beaver Complex |
| <span style="color: blue;">- - -</span> Multiple Split Main Channel | <span style="color: black;">—</span> Glide           |  |
| <span style="color: lightblue;">—</span> Side Channel               | <span style="color: red;">—</span> Pool              | <i>* Preliminary Data</i>                            |
| <span style="color: green;">—</span> Side Slough                    | <span style="color: grey;">—</span> Backwater        |  |
| <span style="color: yellow;">—</span> Upland Slough                 | <span style="color: pink;">—</span> Clearwater Plume |  |

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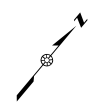




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- |   |  |  |
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| <b>Macrohabitat (2013)*</b>   | <b>Mesohabitat (2013)*</b>                                       |  |
| <span style="color: blue;">—</span> Main Channel                        | <span style="border-bottom: 1px dashed black;">   </span> Riffle | <span style="color: orange;">—</span> Dry            |
| <span style="color: blue;">- - -</span> Split Main Channel              | <span style="border-bottom: 1px dashed black;">   </span> Run    | <span style="color: yellow;">—</span> Beaver Complex |
| <span style="color: blue;">- - - - -</span> Multiple Split Main Channel | <span style="border-bottom: 1px solid black;">   </span> Glide   |  |
| <span style="color: lightblue;">—</span> Side Channel                   | <span style="color: red;">—</span> Pool                          |  |
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- \* Preliminary Data

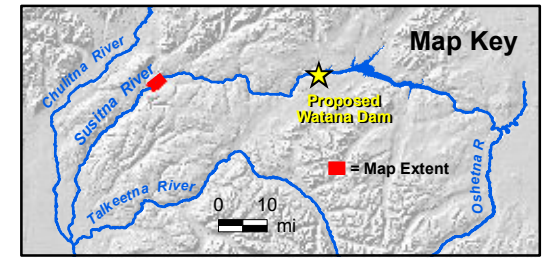
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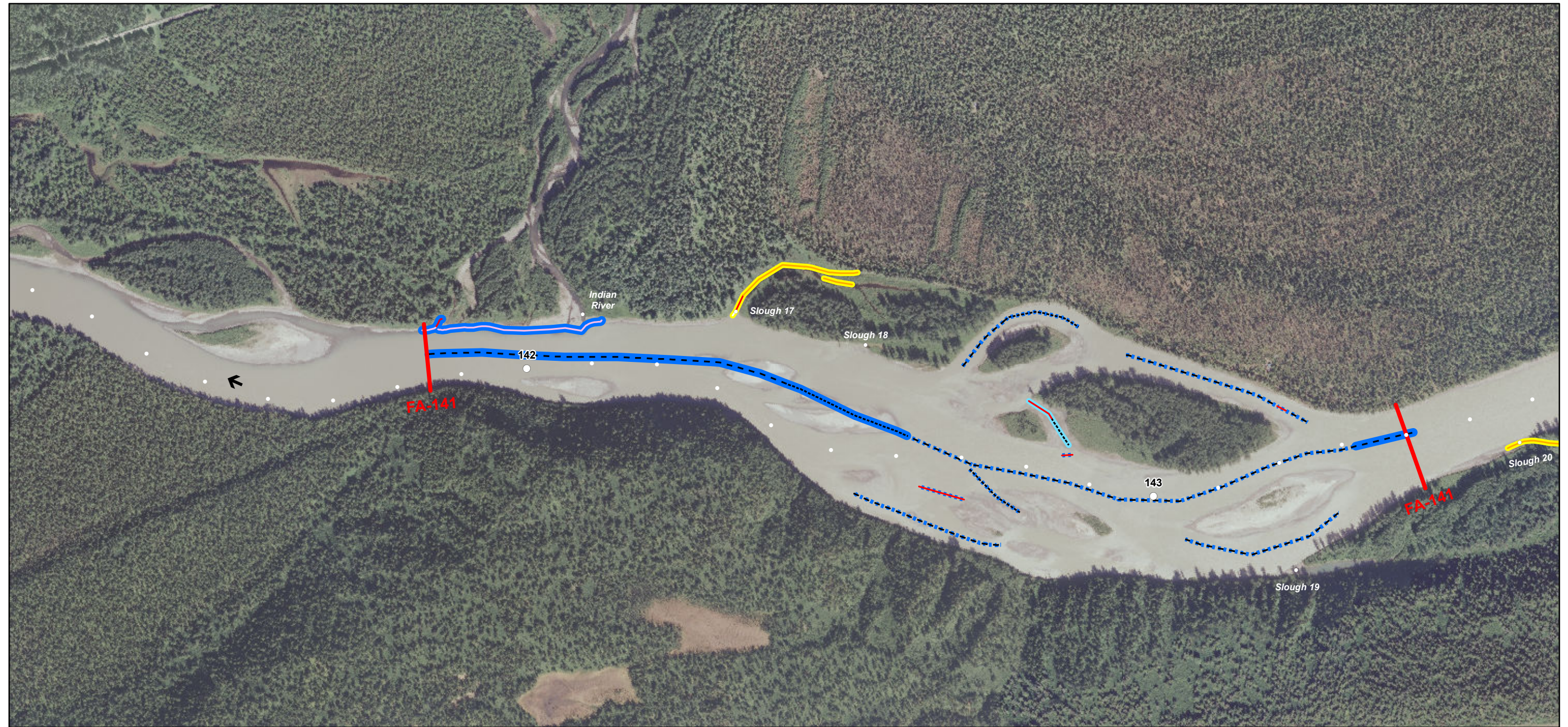


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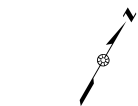


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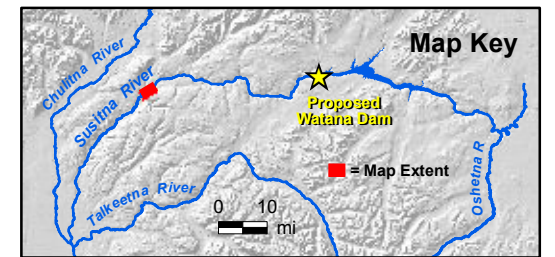
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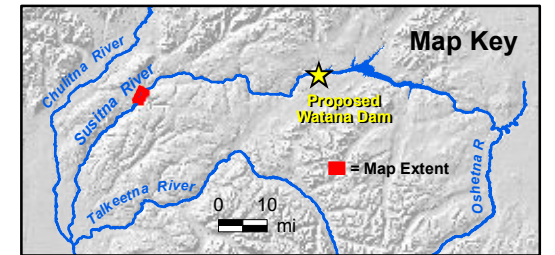


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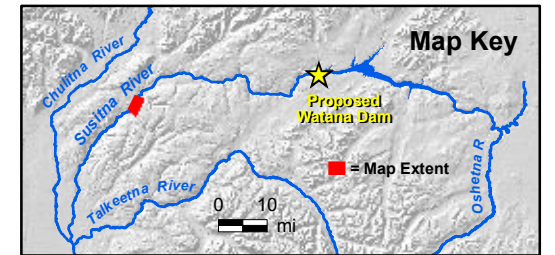


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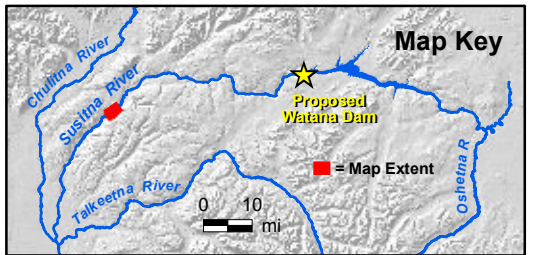
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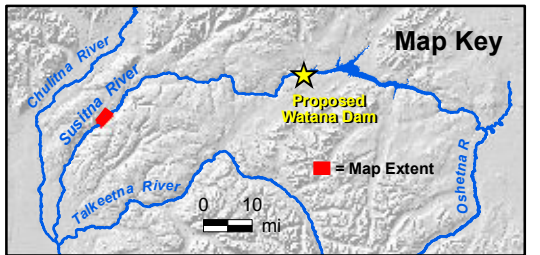
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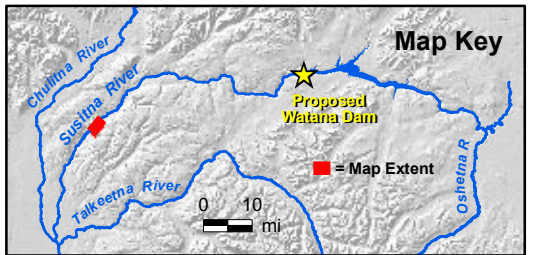
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- Beaver Complex

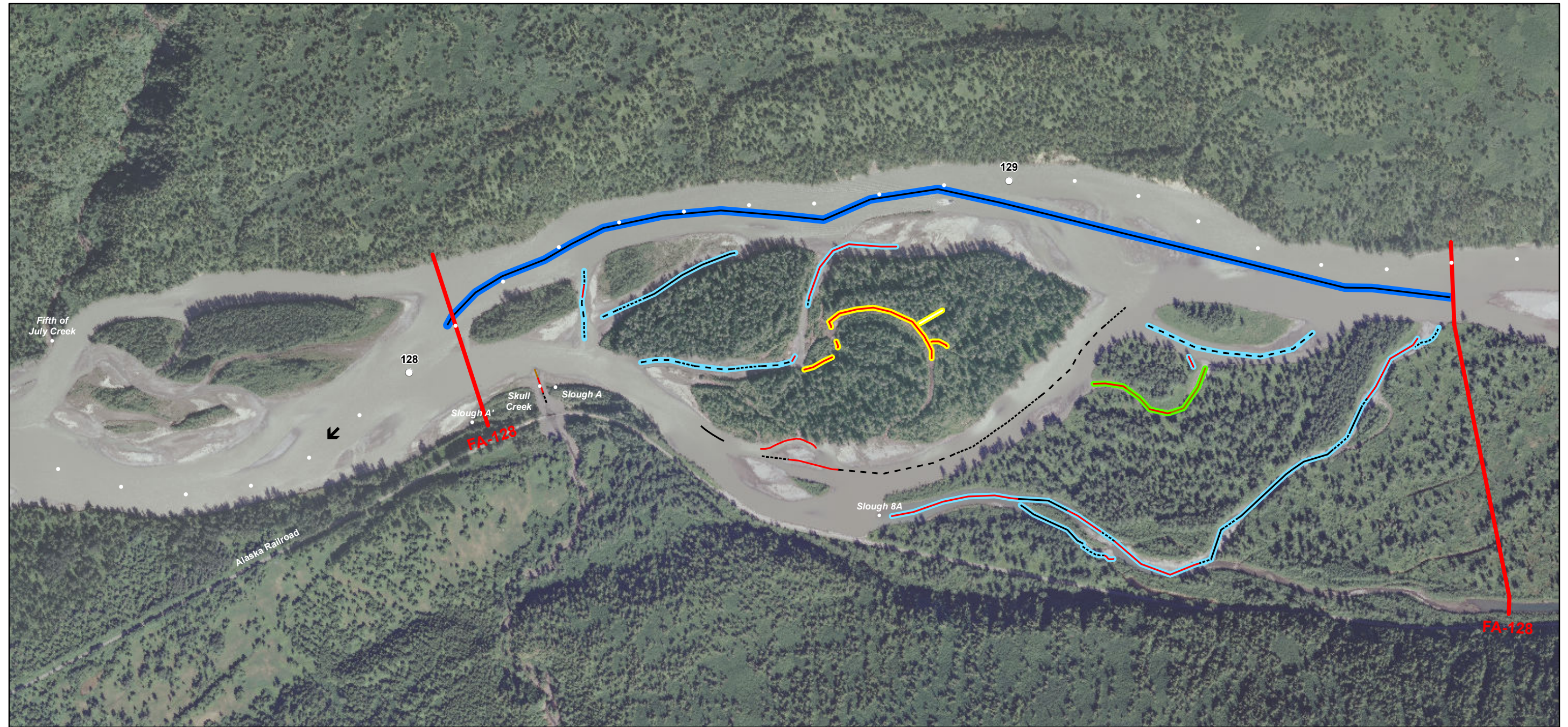
\* Preliminary Data

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- Legend**
- Instream Flow Focus Area (Upper and Lower Extent)
  - Project River Mile
  - ← Flow Arrow

- Macrohabitat (2013)\***
- Main Channel
  - Split Main Channel
  - - - - Multiple Split Main Channel
  - Side Channel
  - Side Slough
  - Upland Slough

- Mesohabitat (2013)\***
- · - · - Riffle
  - - - - Run
  - Glide
  - Pool
  - Backwater
  - Clearwater Plume
  - Dry
  - Beaver Complex
- \* Preliminary Data

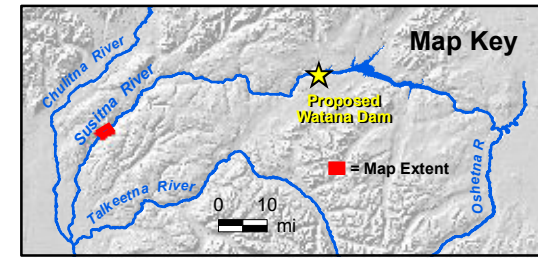
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**ALASKA ENERGY AUTHORITY**

0 1,000 Feet

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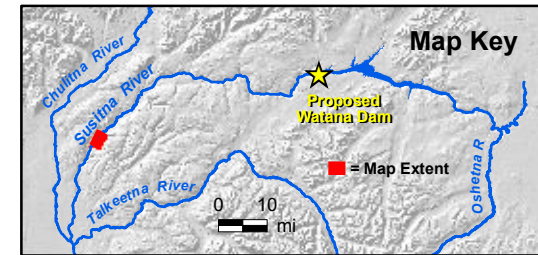
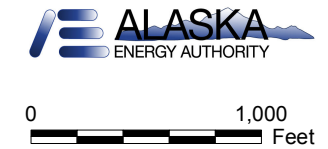




- Legend**
- Instream Flow Focus Area (Upper and Lower Extent)
  - Project River Mile
  - ← Flow Arrow

- Macrohabitat (2013)\***
- Main Channel
  - Split Main Channel
  - - - - Multiple Split Main Channel
  - Side Channel
  - Side Slough
  - Upland Slough

- Mesohabitat (2013)\***
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  - - - - Run
  - Glide
  - Pool
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- Legend**
- Instream Flow Focus Area (Upper and Lower Extent)
  - Project River Mile
  - ← Flow Arrow

- Macrohabitat (2013)\*
- Main Channel
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  - - - - Multiple Split Main Channel
  - Side Channel
  - Side Slough
  - Upland Slough

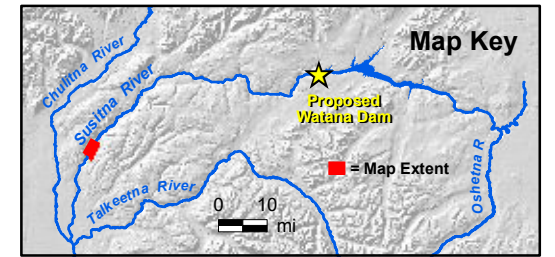
- Mesohabitat (2013)\*
- - - - Riffle
  - - - - Run
  - Glide
  - Pool
  - Backwater
  - Clearwater Plume
  - Dry
  - Beaver Complex
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0 1,000  
Feet

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**Legend**

- Instream Flow Focus Area (Upper and Lower Extent)
- Project River Mile
- ← Flow Arrow

**Macrohabitat (2013)\***

- Main Channel
- Split Main Channel
- - - Multiple Split Main Channel
- Side Channel
- Side Slough
- Upland Slough

**Mesohabitat (2013)\***

- - - Riffle
- - - Run
- Glide
- Pool
- Backwater
- Clearwater Plume

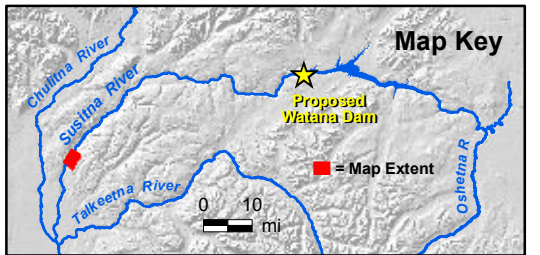
- Dry
- Beaver Complex

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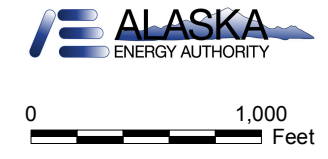




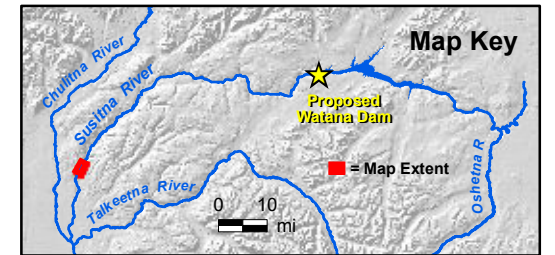
- Legend**
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- Main Channel
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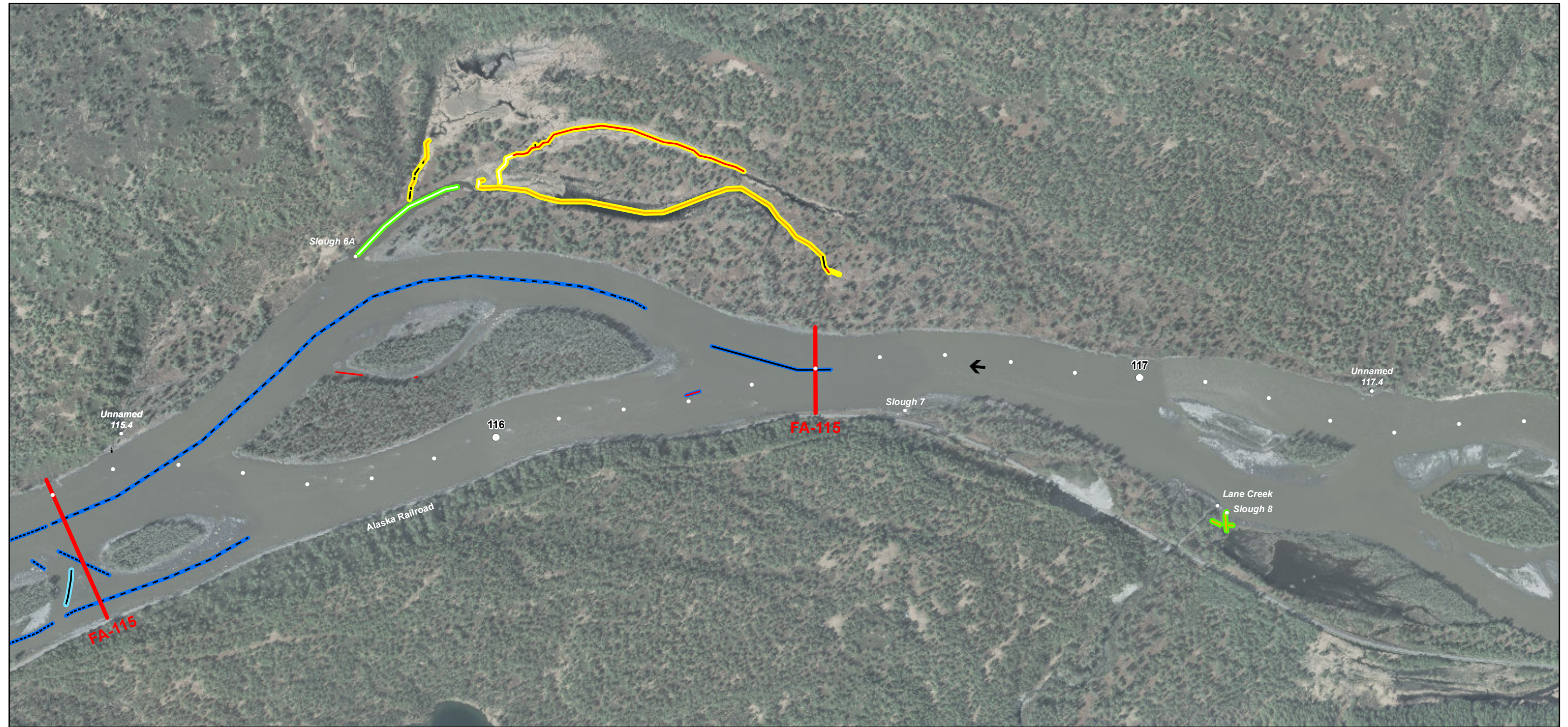
- Mesohabitat (2013)\***
- - - - Riffle
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**Legend**

	Instream Flow Focus Area (Upper and Lower Extent)
	Project River Mile
	Flow Arrow

**Macrohabitat (2013)\***

	Main Channel
	Split Main Channel
	Multiple Split Main Channel
	Side Channel
	Side Slough
	Upland Slough

**Mesohabitat (2013)\***

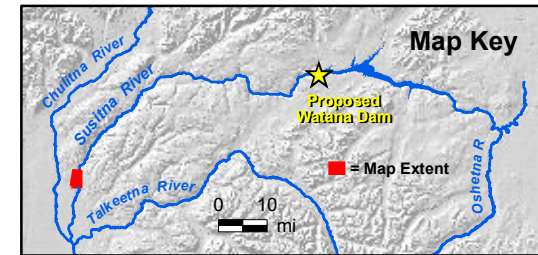
	Riffle		Dry
	Run		Beaver Complex
	Glide		
	Pool		
	Backwater		
	Clearwater Plume		

*\* Preliminary Data*

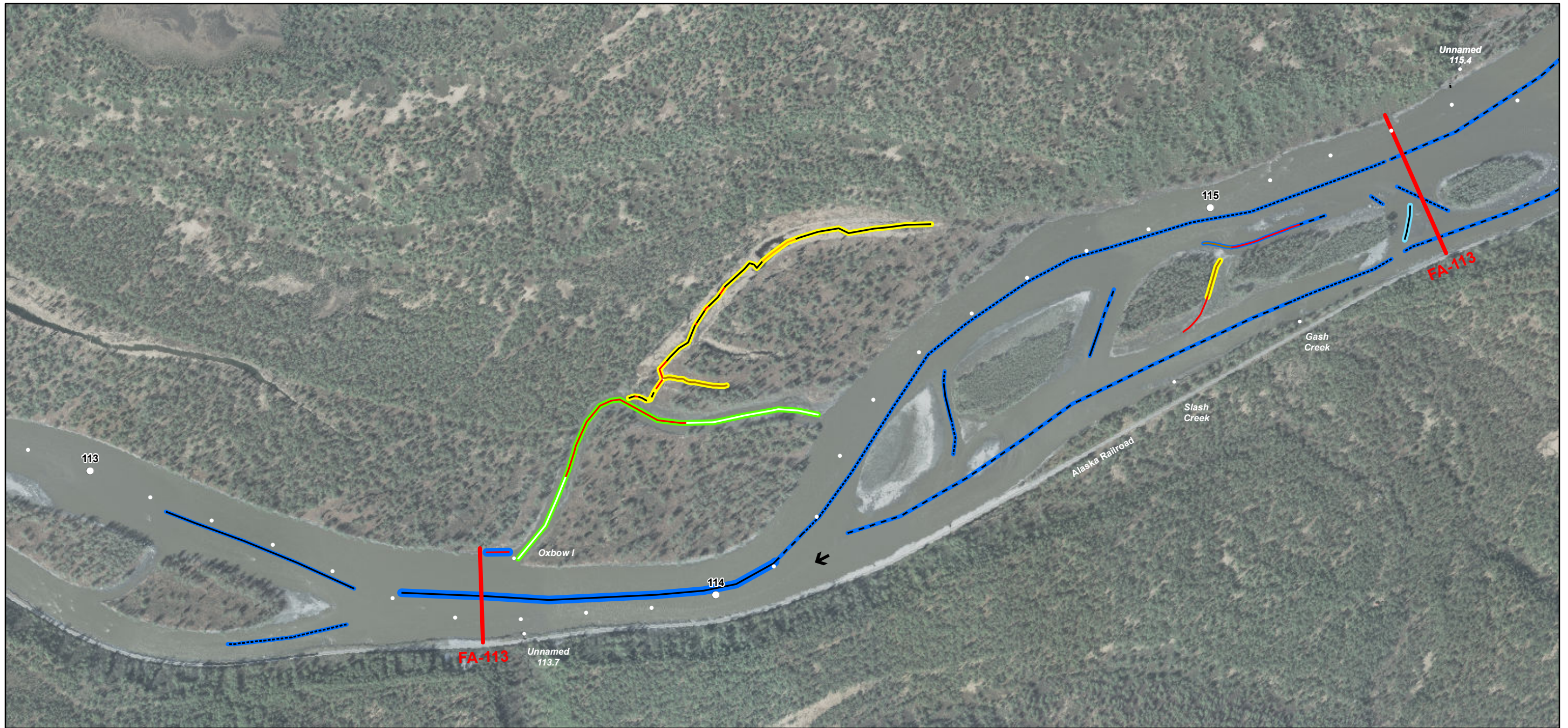
**ALASKA ENERGY AUTHORITY**

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Mesohabitat (2013)\*

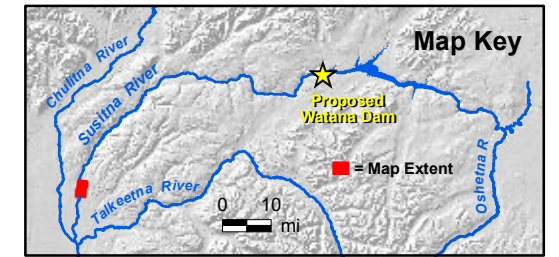
- - - Riffle
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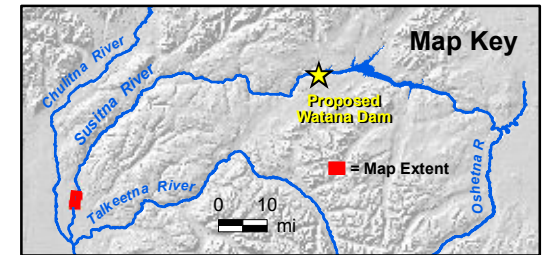
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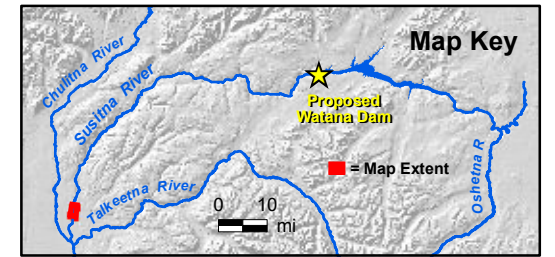
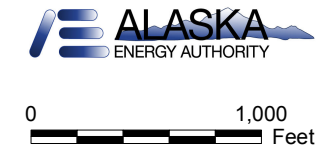




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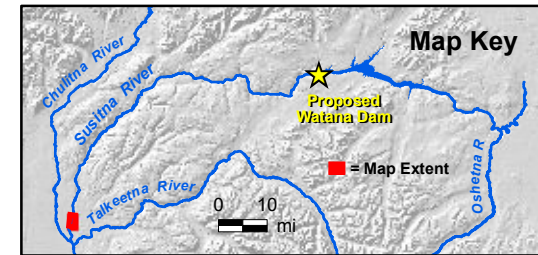
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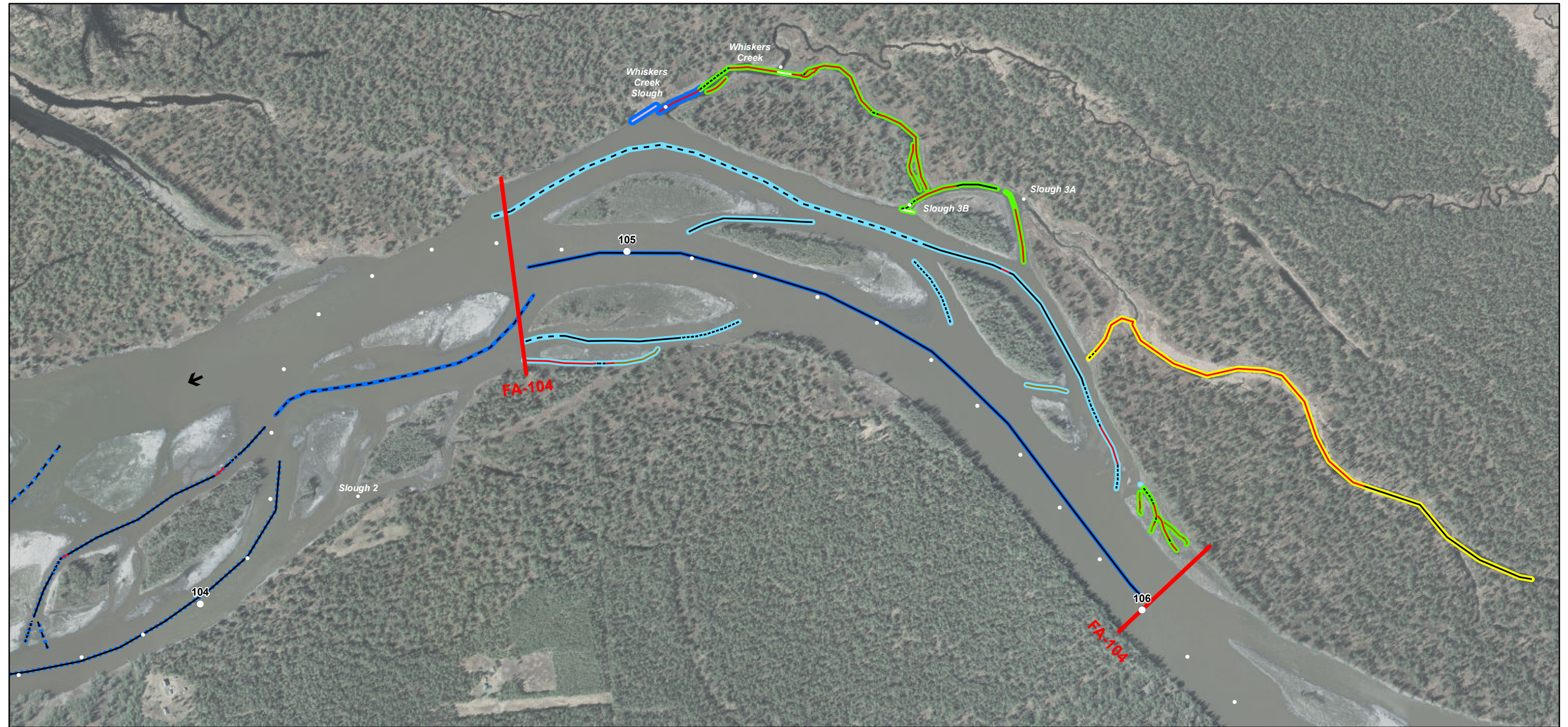
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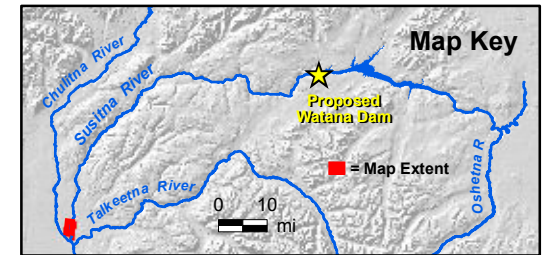
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  - ← Flow Arrow

- |   |   |   |
|---|---|---|
| <p><b>Macrohabitat (2013)*</b></p> <ul style="list-style-type: none"> <li><span style="color: blue;">—</span> Main Channel</li> <li><span style="color: blue;">- - -</span> Split Main Channel</li> <li><span style="color: blue;">- - - -</span> Multiple Split Main Channel</li> <li><span style="color: cyan;">—</span> Side Channel</li> <li><span style="color: green;">—</span> Side Slough</li> <li><span style="color: yellow;">—</span> Upland Slough</li> </ul> | <p><b>Mesohabitat (2013)*</b></p> <ul style="list-style-type: none"> <li><span style="color: brown;">- - - -</span> Riffle</li> <li><span style="color: black;">- - - -</span> Run</li> <li><span style="color: black;">—</span> Glide</li> <li><span style="color: red;">—</span> Pool</li> <li><span style="color: grey;">—</span> Backwater</li> <li><span style="color: pink;">—</span> Clearwater Plume</li> </ul> | <ul style="list-style-type: none"> <li><span style="color: orange;">—</span> Dry</li> <li><span style="color: yellow;">—</span> Beaver Complex</li> </ul> <p>* Preliminary Data</p> |
|---|---|---|

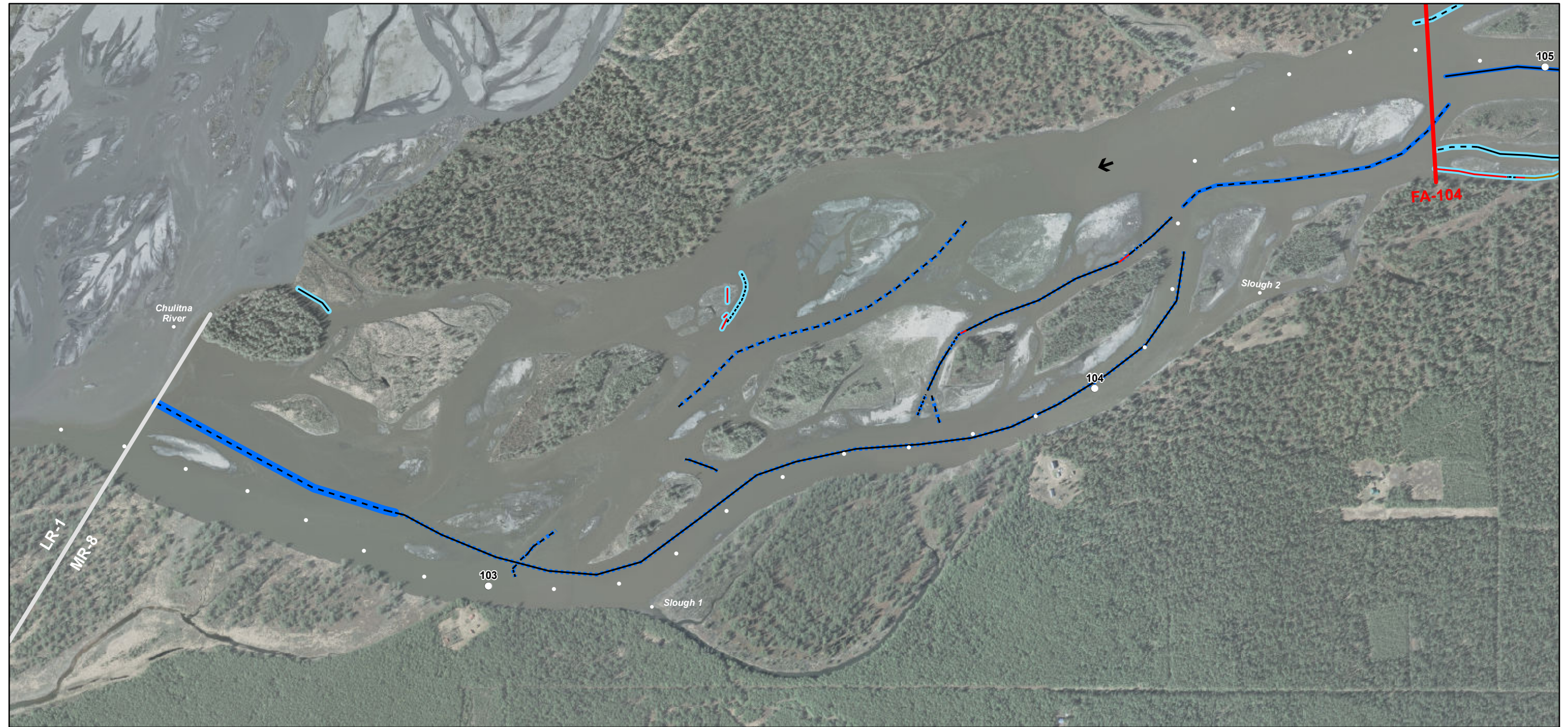
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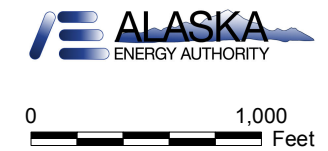


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