

Susitna-Watana Hydroelectric Project Document

ARLIS Uniform Cover Page

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APPENDIX D: MIDDLE RIVER MAINSTEM SURVEYS, 2013

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

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

**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.

February 2014 Draft



Legend

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

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

	Dry
	Beaver Complex

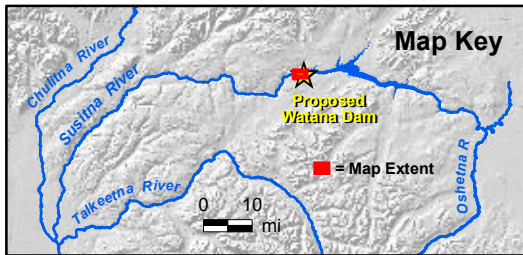
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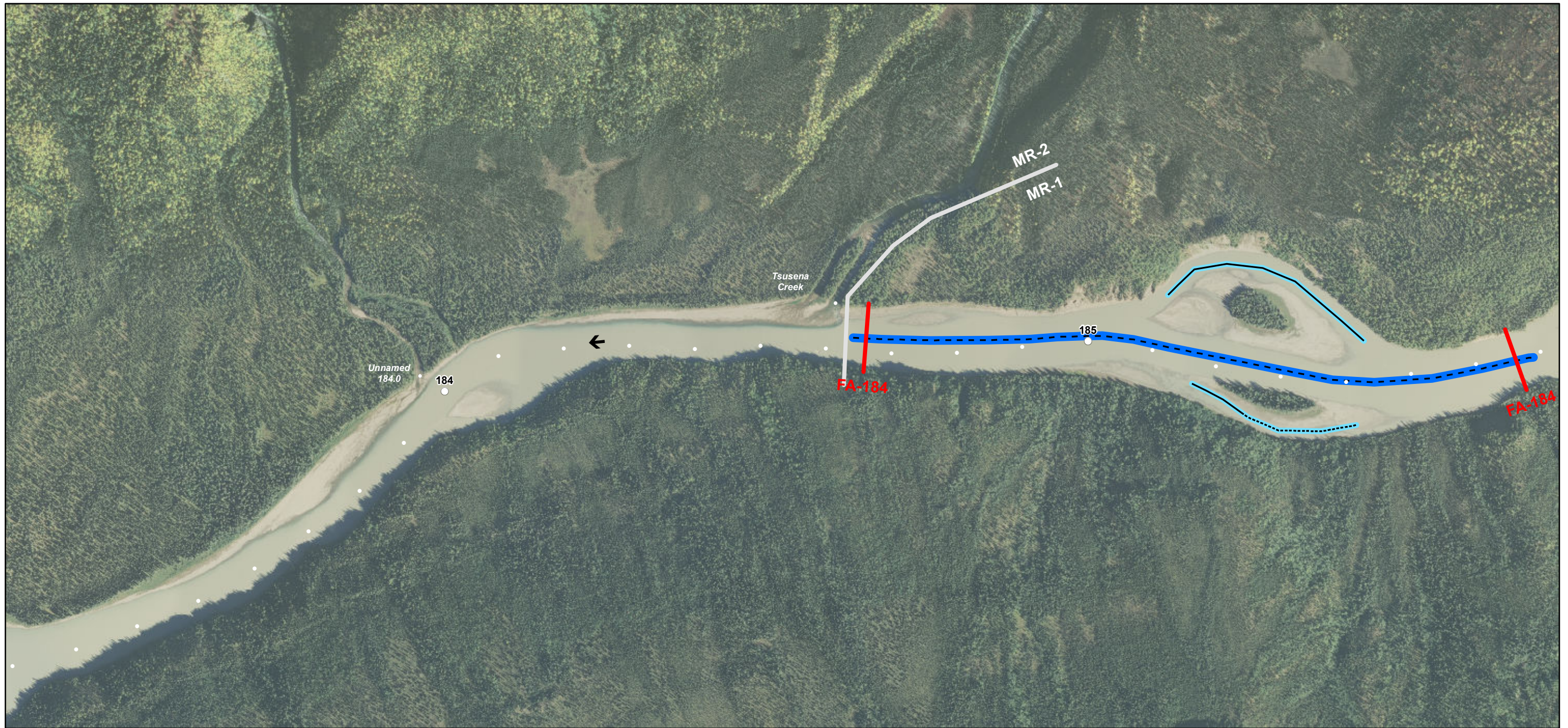
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ALASKA ENERGY AUTHORITY

0 1,000 Feet

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

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

	Dry
	Beaver Complex

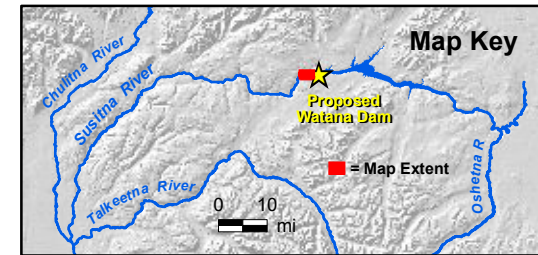
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Legend

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

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

Mesohabitat (2013)*

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

- Dry
- Beaver Complex

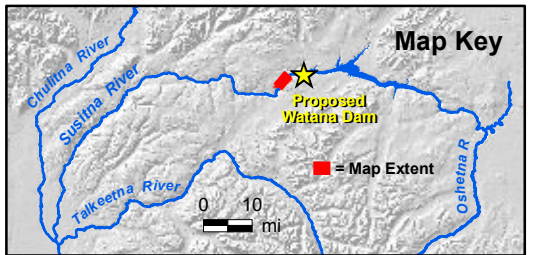
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Mesohabitat (2013)*

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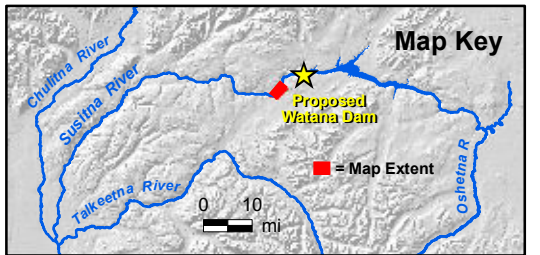
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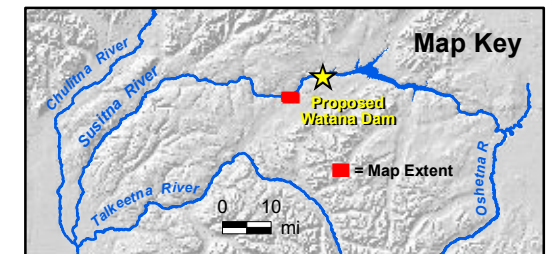
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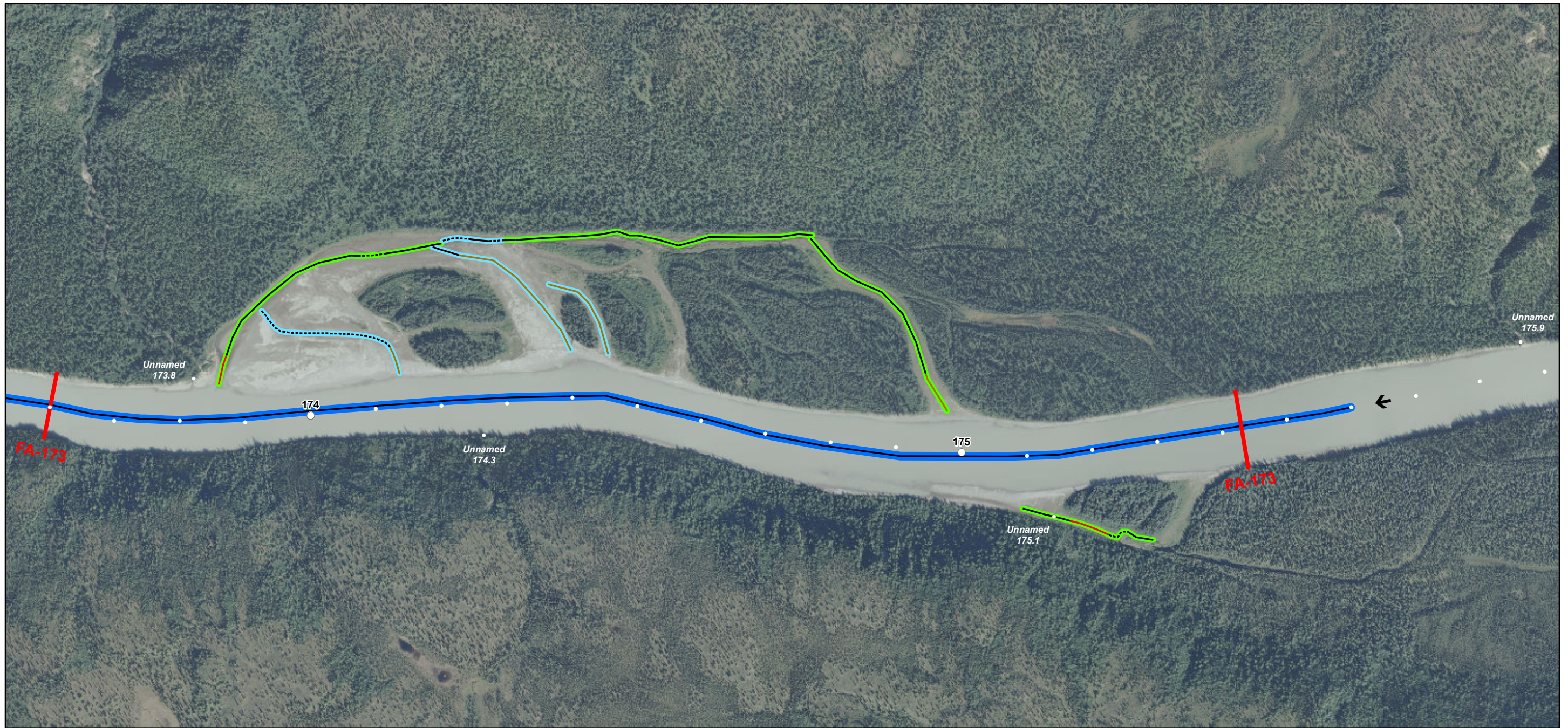
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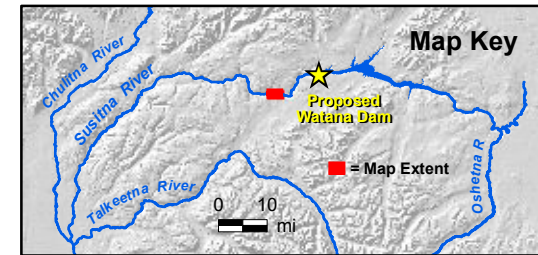
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 - Dry
 - Beaver Complex
- * Preliminary Data*

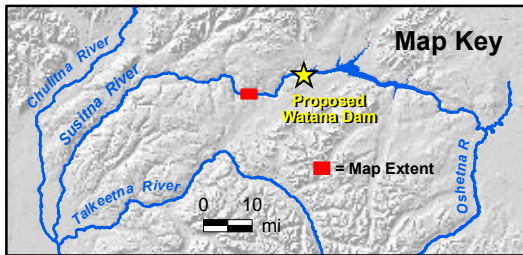
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ALASKA ENERGY AUTHORITY

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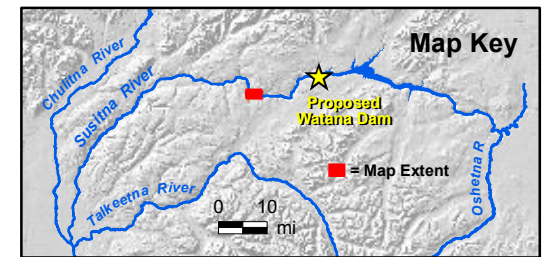
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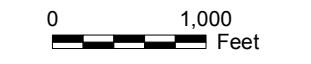
Mesohabitat (2013)*

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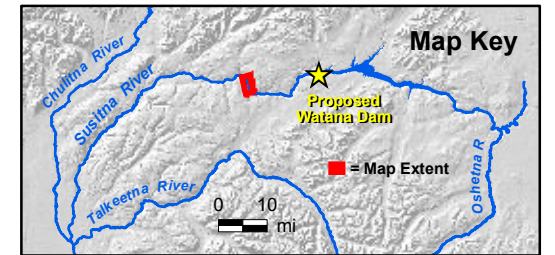
- Dry
- Beaver Complex

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Projection: AK SP Zone 4 NAD 1983
 Date Created: 1/29/2014
 Map Author: R2 - Joetta Zabolney
 File: Map_ISR_FA_AQHAB_MSP9.mxd





Legend

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

Macrohabitat (2013)*

- Main Channel
- Split Main Channel
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Mesohabitat (2013)*

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- Glide
- Pool
- Backwater
- Clearwater Plume

- Dry
- Beaver Complex

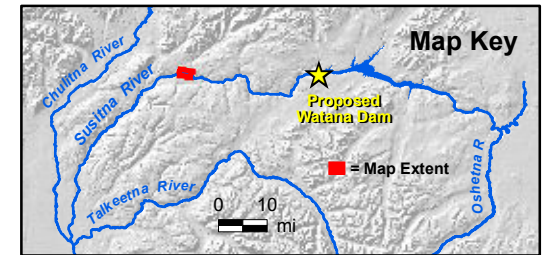
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Projection: AK SP Zone 4 NAD 1983
 Date Created: 1/29/2014
 Map Author: R2 - Joetta Zabolney
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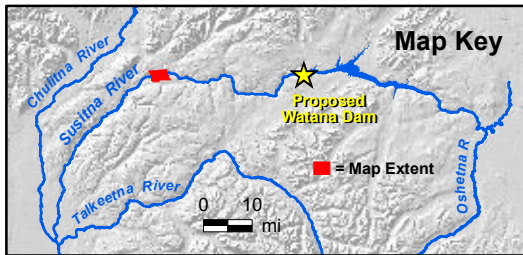
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0 1,000 Feet

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Legend	
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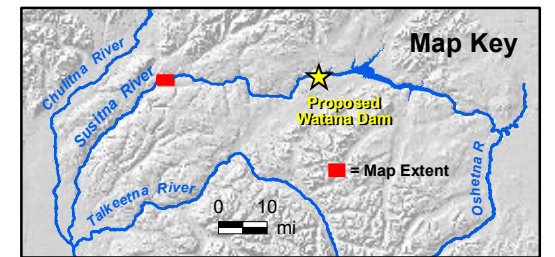
Macrohabitat (2013)*	
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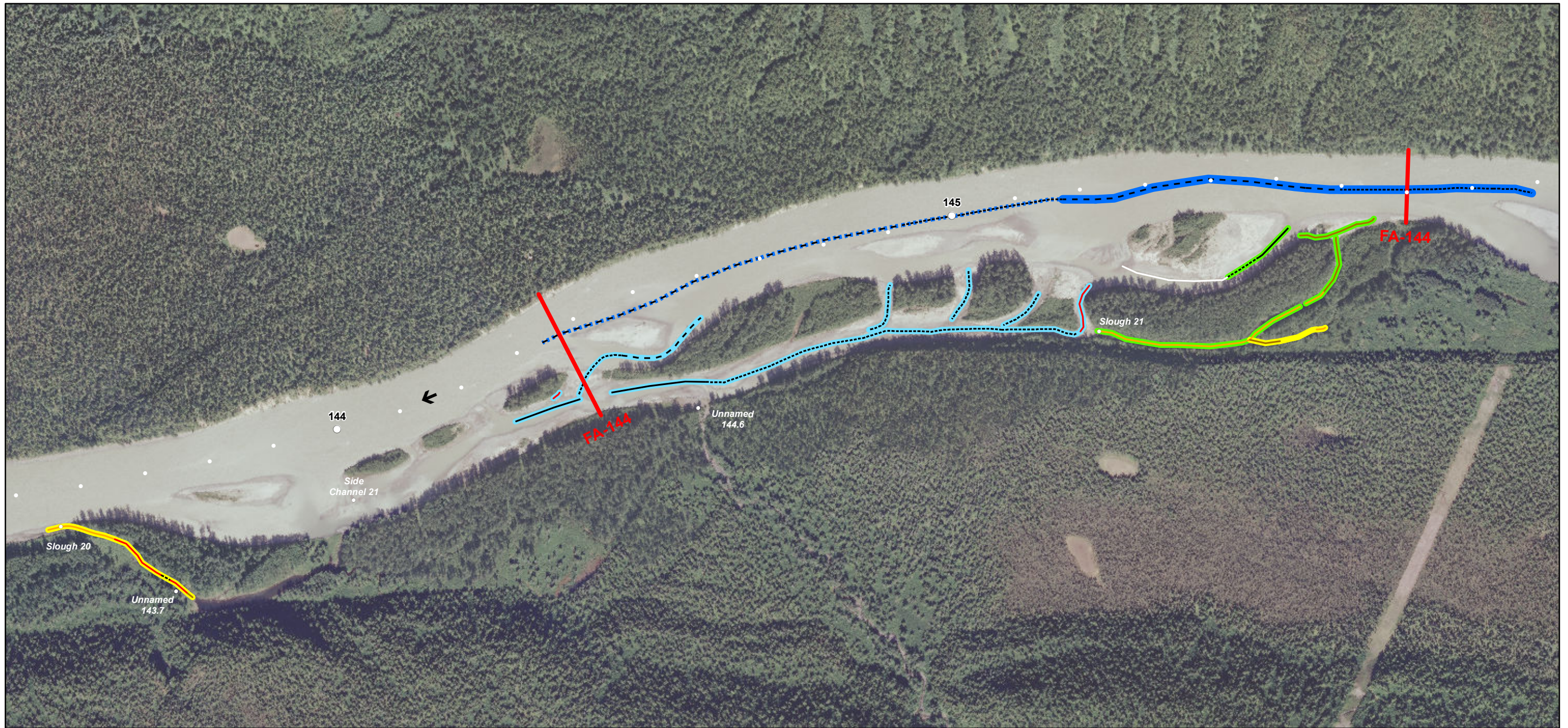
Mesohabitat (2013)*	
	Riffle
	Run
	Glide
	Pool
	Backwater
	Clearwater Plume
	Dry
	Beaver Complex

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Legend

- Instream Flow Focus Area (Upper and Lower Extent)
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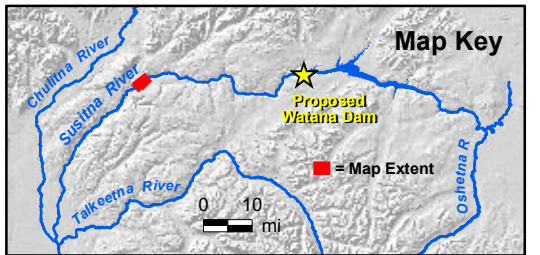
- Dry
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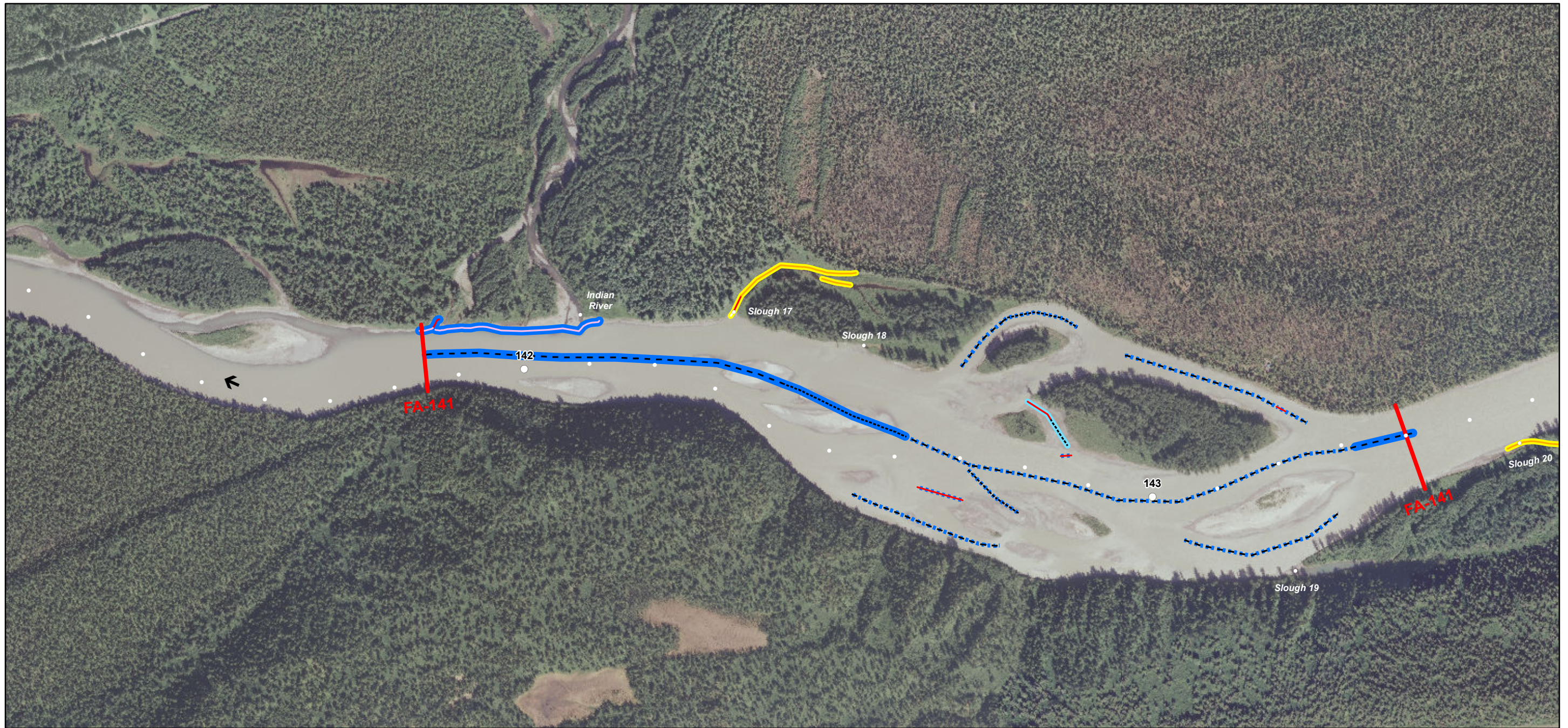
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Legend

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Mesohabitat (2013)*

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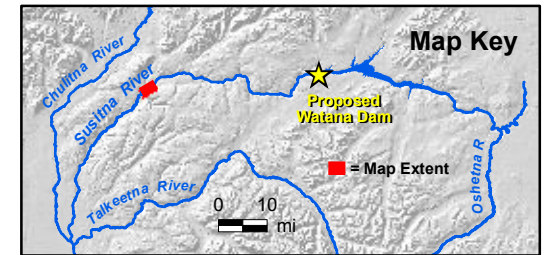
- Dry
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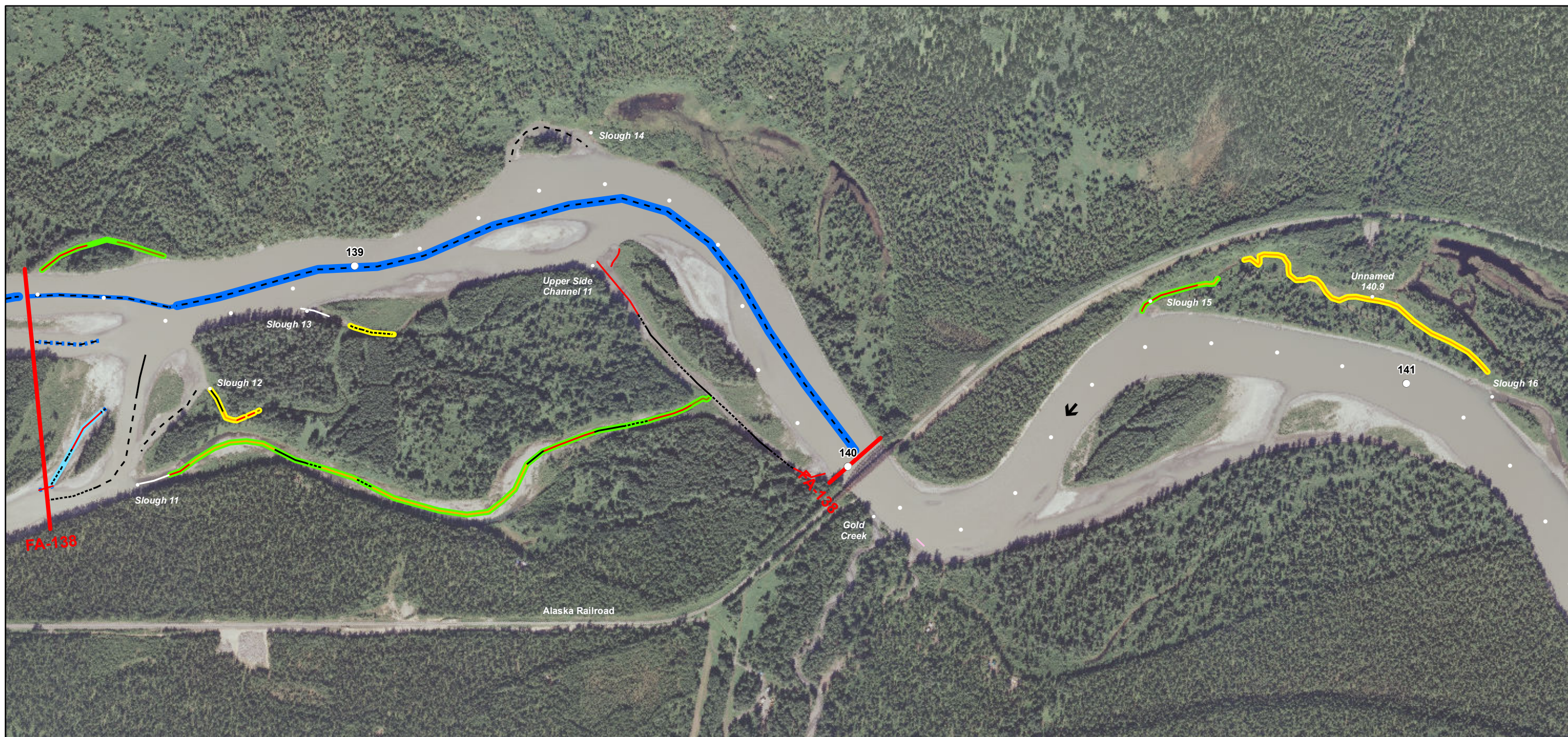
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- Instream Flow Focus Area (Upper and Lower Extent)
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- | | | |
|--|---|--|
| <p>Macrohabitat (2013)*</p> <ul style="list-style-type: none"> — Main Channel - - - Split Main Channel - · - · - Multiple Split Main Channel — Side Channel — Side Slough — Upland Slough | <p>Mesohabitat (2013)*</p> <ul style="list-style-type: none"> - · - · - Riffle - - - Run — Glide — Pool — Backwater — Clearwater Plume | <ul style="list-style-type: none"> — Dry — Beaver Complex <p>* Preliminary Data</p> |
|--|---|--|

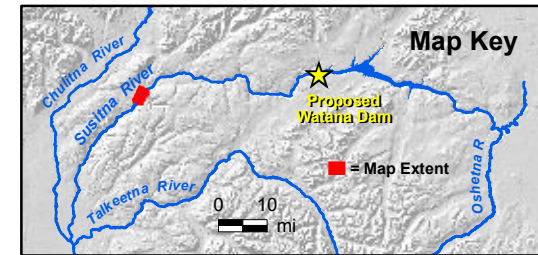
Orthophoto Source: 2011 Matanuska-Susitna Borough LiDAR & Imagery Project

ALASKA ENERGY AUTHORITY

0 1,000 Feet

0 10 mi

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 Date Created: 1/29/2014
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<p>Legend</p> <ul style="list-style-type: none"> — Instream Flow Focus Area (Upper and Lower Extent) ○ Project River Mile ← Flow Arrow 		<p>Macrohabitat (2013)*</p> <ul style="list-style-type: none"> — Main Channel - - - Split Main Channel - - - - - Multiple Split Main Channel — Side Channel — Side Slough — Upland Slough 		<p>Mesohabitat (2013)*</p> <ul style="list-style-type: none"> - - - - - Riffle - - - Run — Glide — Pool — Backwater — Clearwater Plume 		<ul style="list-style-type: none"> — Dry — Beaver Complex <p>* Preliminary Data</p>						<p>Map Key</p> <ul style="list-style-type: none"> ★ Proposed Watana Dam ■ = Map Extent 	
<p>Orthophoto Source: 2011 Matanuska-Susitna Borough LiDAR & Imagery Project</p>						<p>ALASKA ENERGY AUTHORITY</p>		<p>Projection: AK SP Zone 4 NAD 1983 Date Created: 1/29/2014 Map Author: R2 - Joetta Zabolney File: Map_ISR_FA_AQHAB_MS.mxd</p>		<p>0 10 mi</p>			



Legend

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

- Main Channel
- - - Split Main Channel
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Mesohabitat (2013)*

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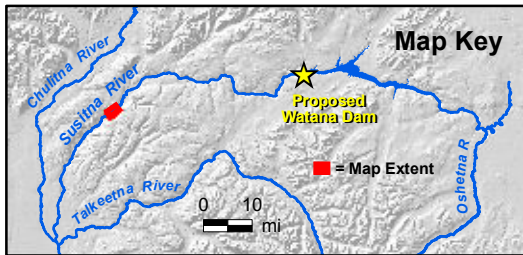
- Dry
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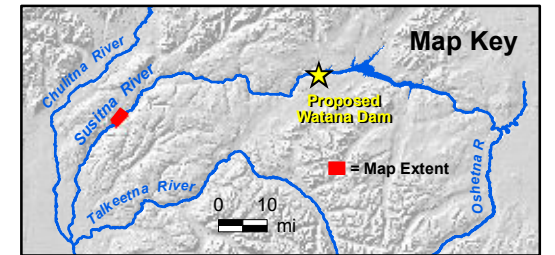
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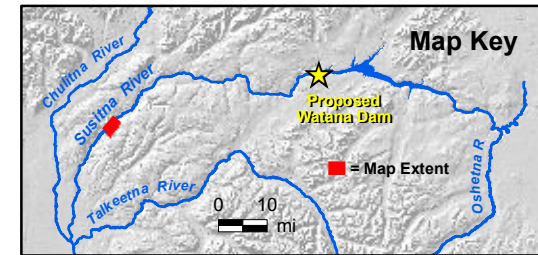
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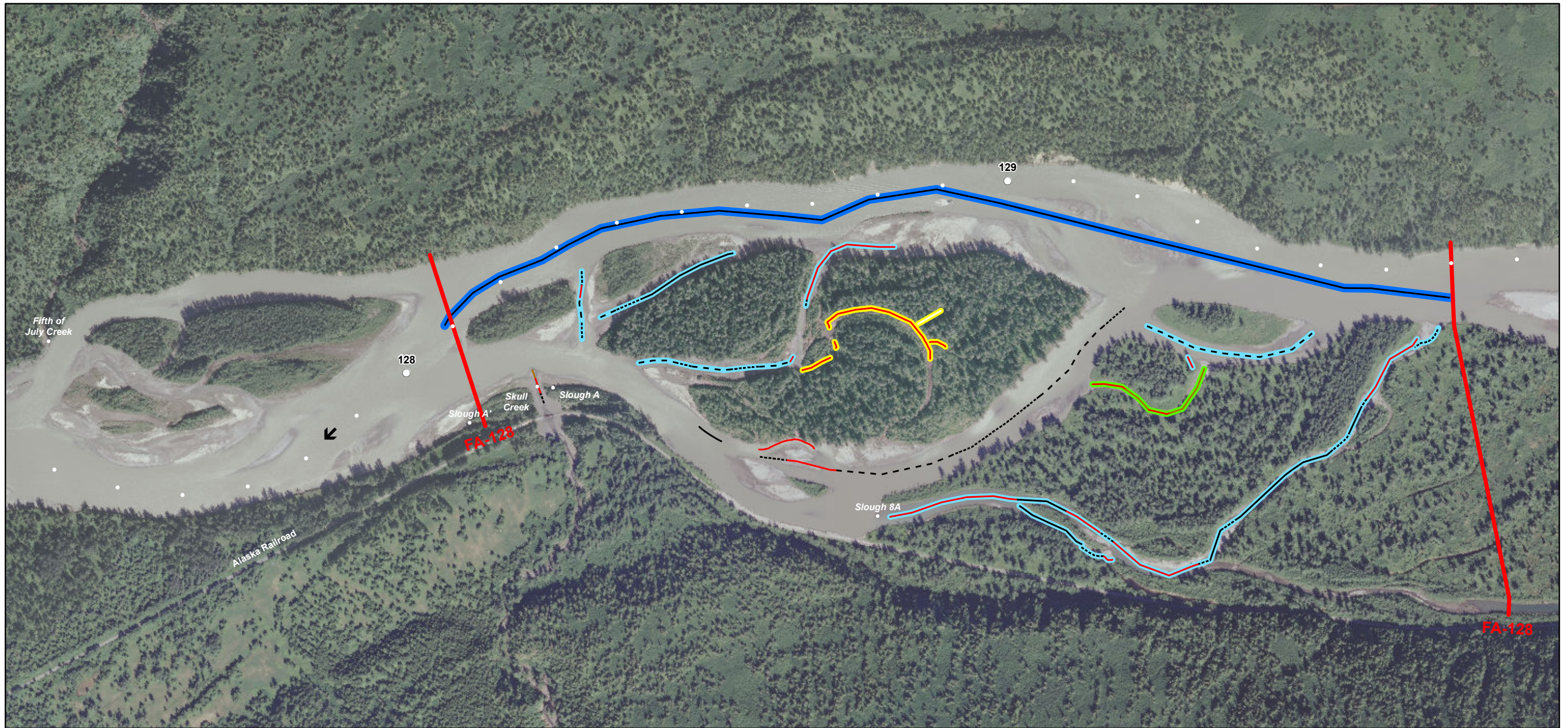
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ALASKA ENERGY AUTHORITY

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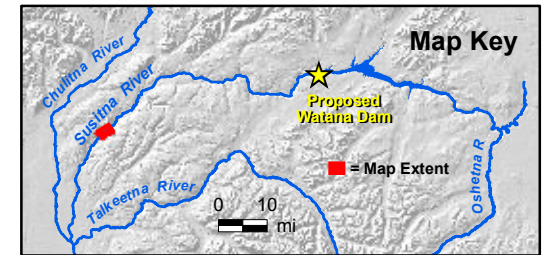
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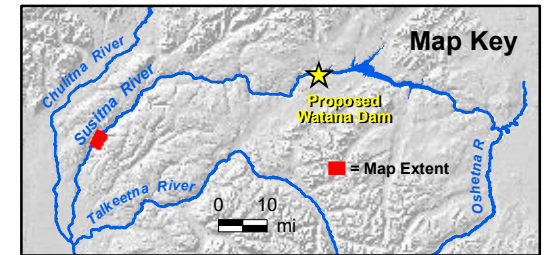
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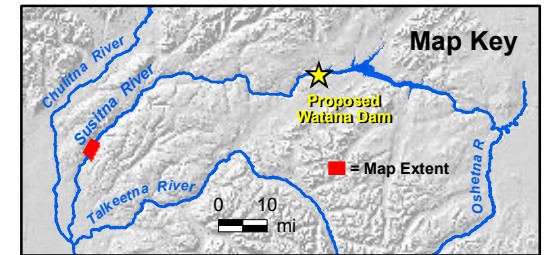
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| <p>Macrohabitat (2013)*</p> <ul style="list-style-type: none"> — Main Channel — Split Main Channel - - - - Multiple Split Main Channel — Side Channel — Side Slough — Upland Slough | <p>Mesohabitat (2013)*</p> <ul style="list-style-type: none"> - - - - Riffle - - - - Run — Glide — Pool — Backwater — Clearwater Plume | <ul style="list-style-type: none"> — Dry — Beaver Complex <p>* Preliminary Data</p> |
|---|---|---|

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- Backwater
- Clearwater Plume

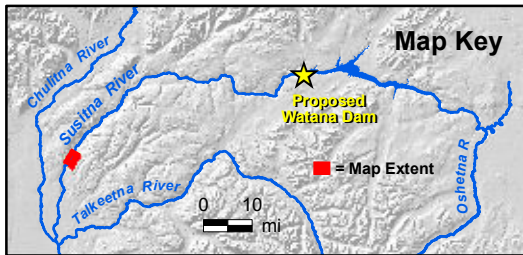
- Dry
- Beaver Complex

* 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

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

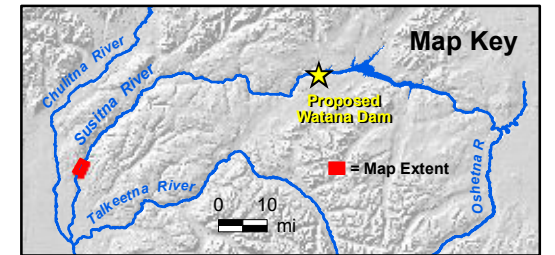
- Dry
- Beaver Complex

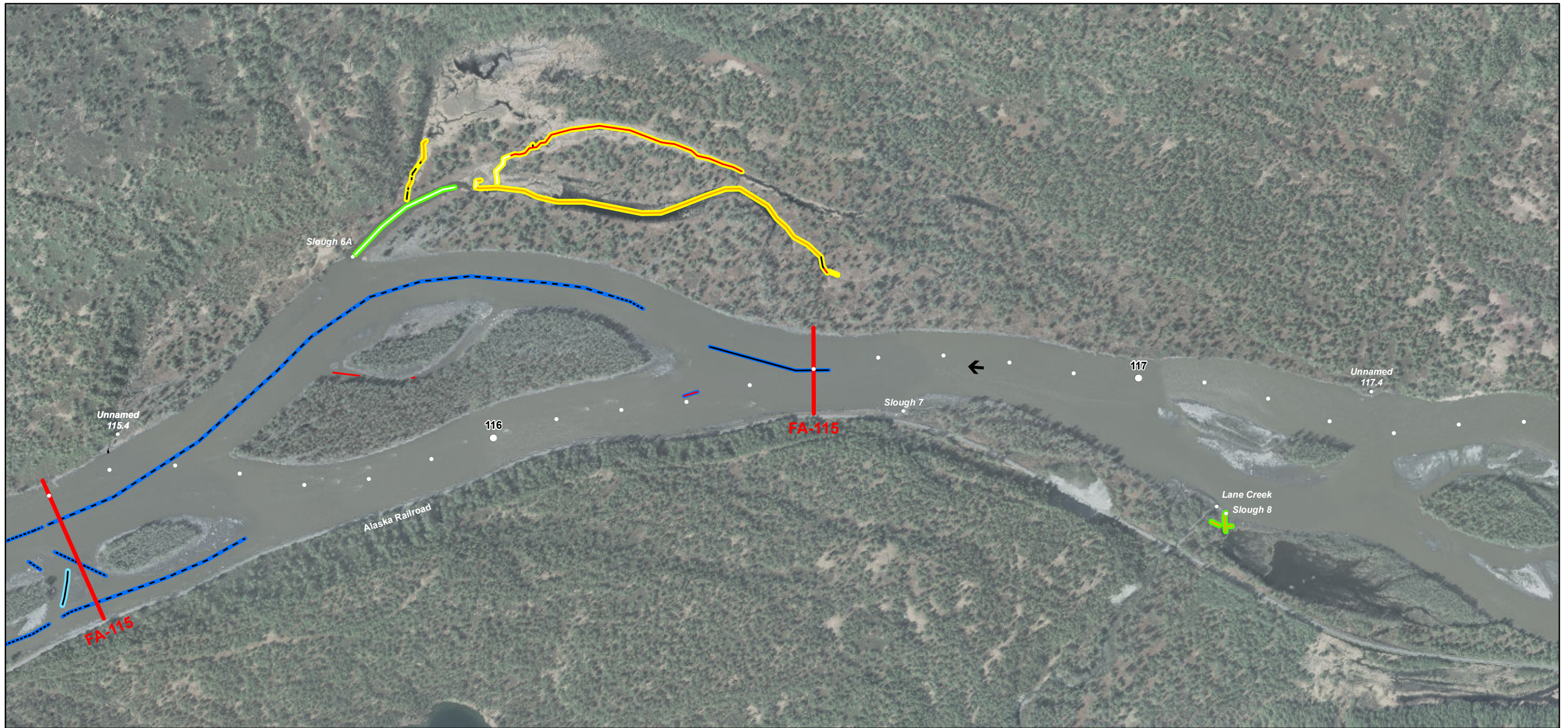
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Mesohabitat (2013)*

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- - - Run
- Glide
- Pool
- Backwater
- Clearwater Plume
- Dry
- Beaver Complex

** Preliminary Data*

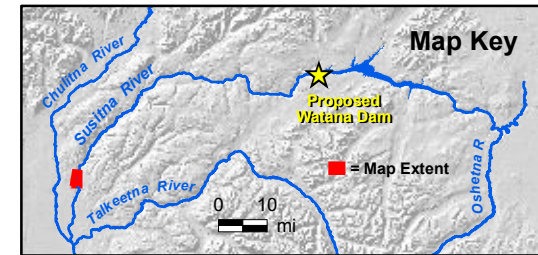
Orthophoto Source: 2011 Matanuska-Susitna Borough LiDAR & Imagery Project

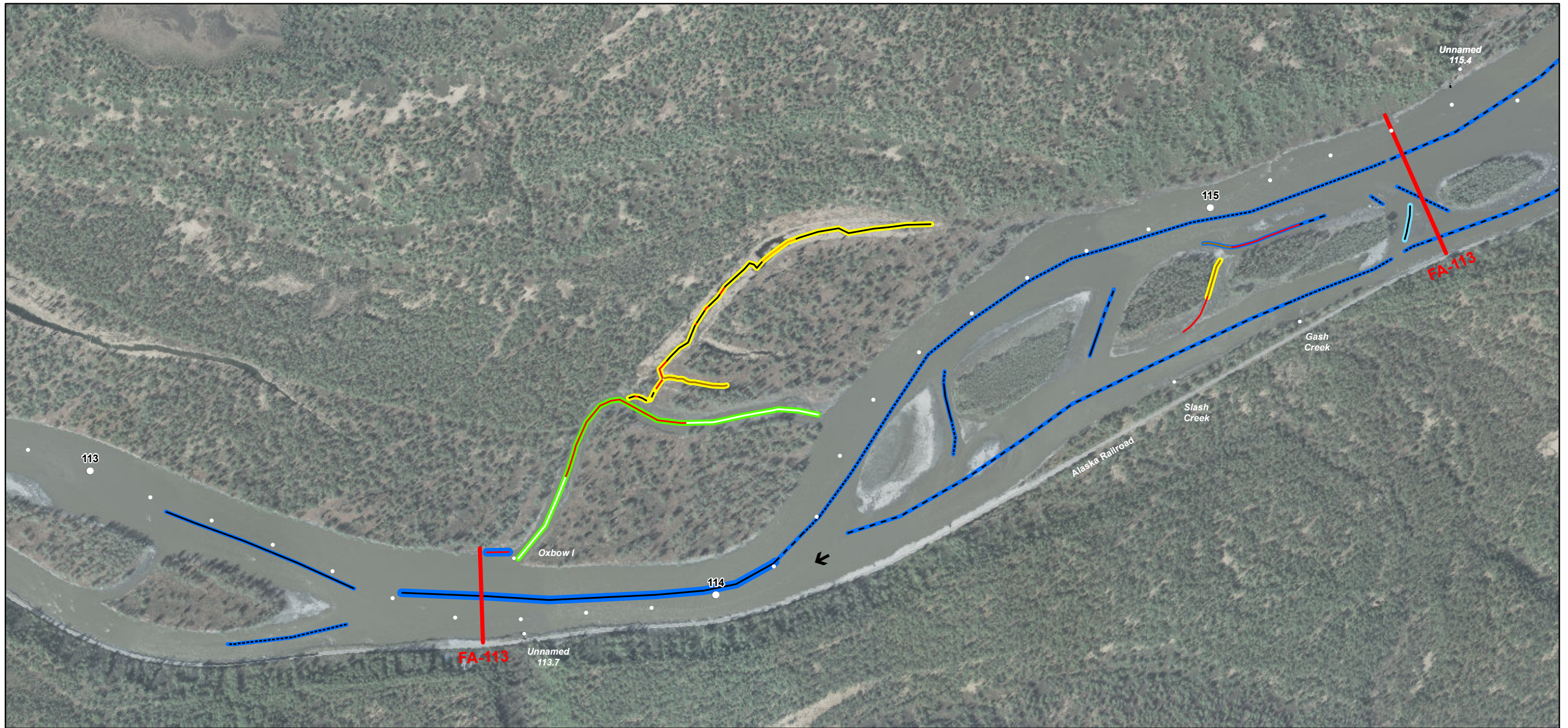
ALASKA ENERGY AUTHORITY

0 1,000 Feet

0 10 mi

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- Legend**
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 - ← Flow Arrow

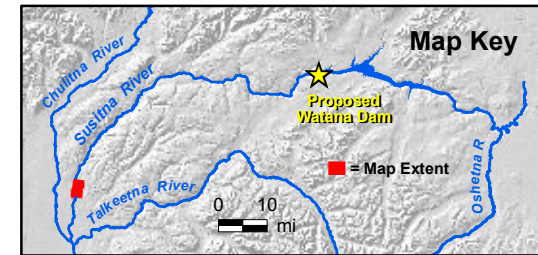
- | | | |
|--|---|--|
| <p>Macrohabitat (2013)*</p> <ul style="list-style-type: none"> — Main Channel - - - Split Main Channel - · - · - Multiple Split Main Channel — Side Channel — Side Slough — Upland Slough | <p>Mesohabitat (2013)*</p> <ul style="list-style-type: none"> - · - · - Riffle - - - Run — Glide — Pool — Backwater — Clearwater Plume | <ul style="list-style-type: none"> — Dry — Beaver Complex <p>* Preliminary Data</p> |
|--|---|--|

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

ALASKA ENERGY AUTHORITY

0 1,000 Feet

Projection: AK SP Zone 4 NAD 1983
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- Macrohabitat (2013)***
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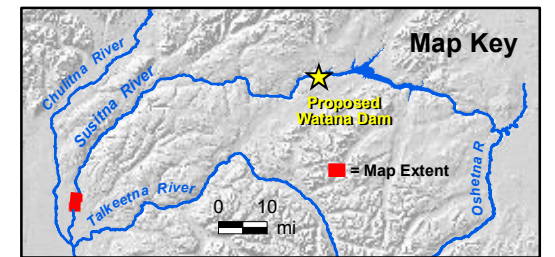
- Mesohabitat (2013)***
- - - - Riffle
 - - - Run
 - Glide
 - Pool
 - Backwater
 - Clearwater Plume
 - Dry
 - Beaver Complex
- * Preliminary Data*

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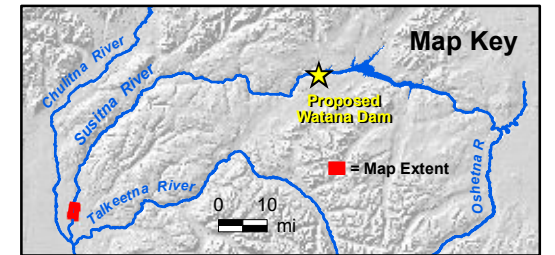
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Legend

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

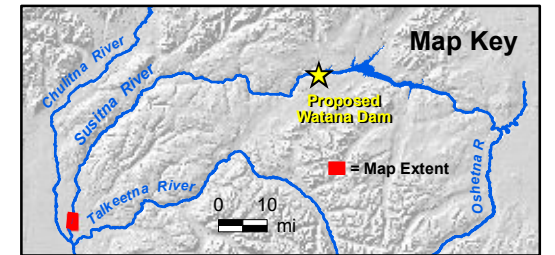
Macrohabitat (2013)*		Mesohabitat (2013)*	
	Main Channel		Riffle
	Split Main Channel		Run
	Multiple Split Main Channel		Glide
	Side Channel		Pool
	Side Slough		Backwater
	Upland Slough		Clearwater Plume

	Dry
	Beaver Complex

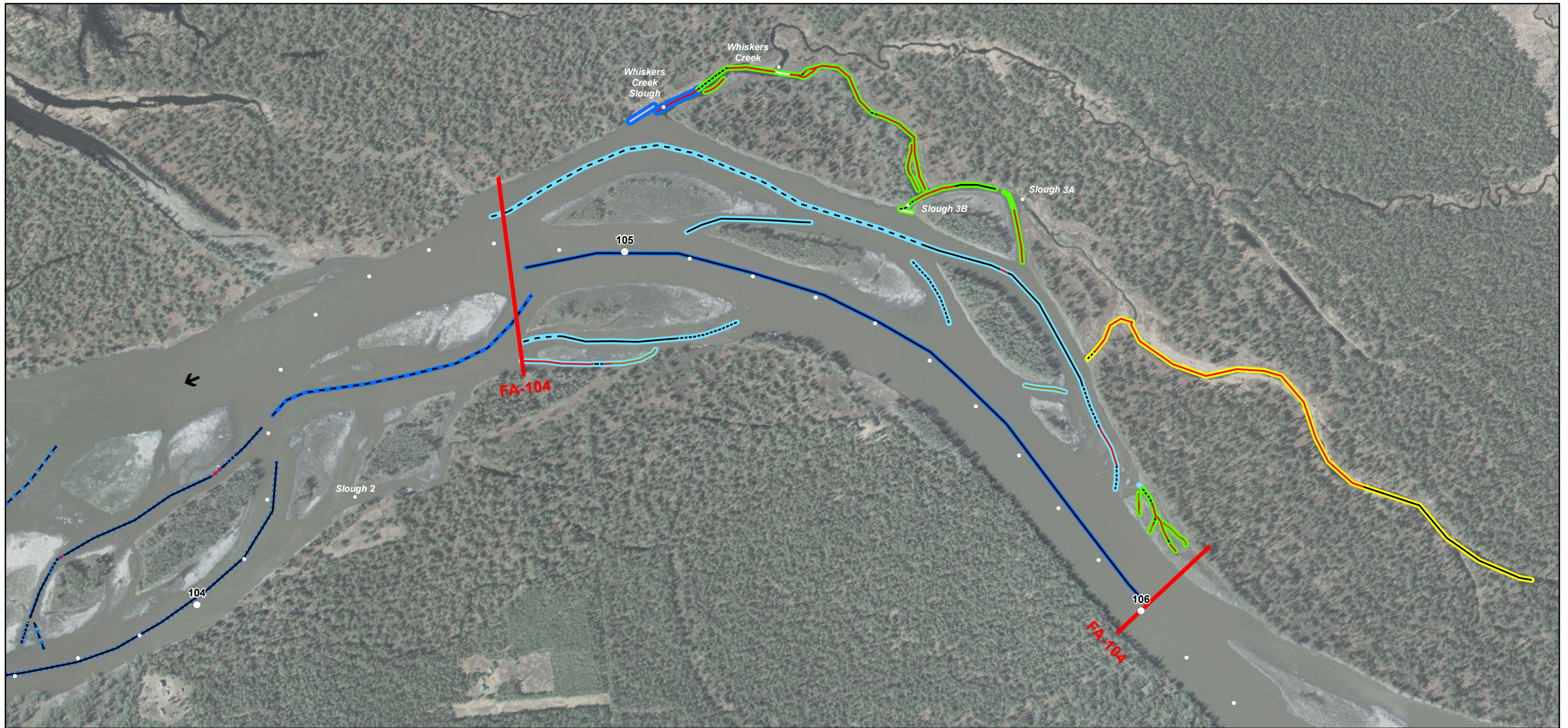
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- Dry
- Beaver Complex

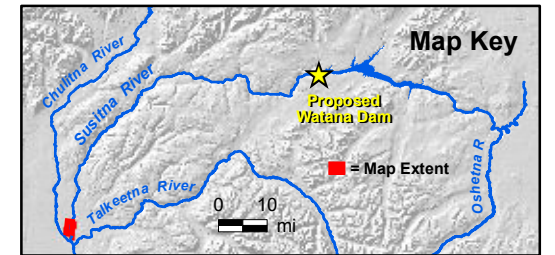
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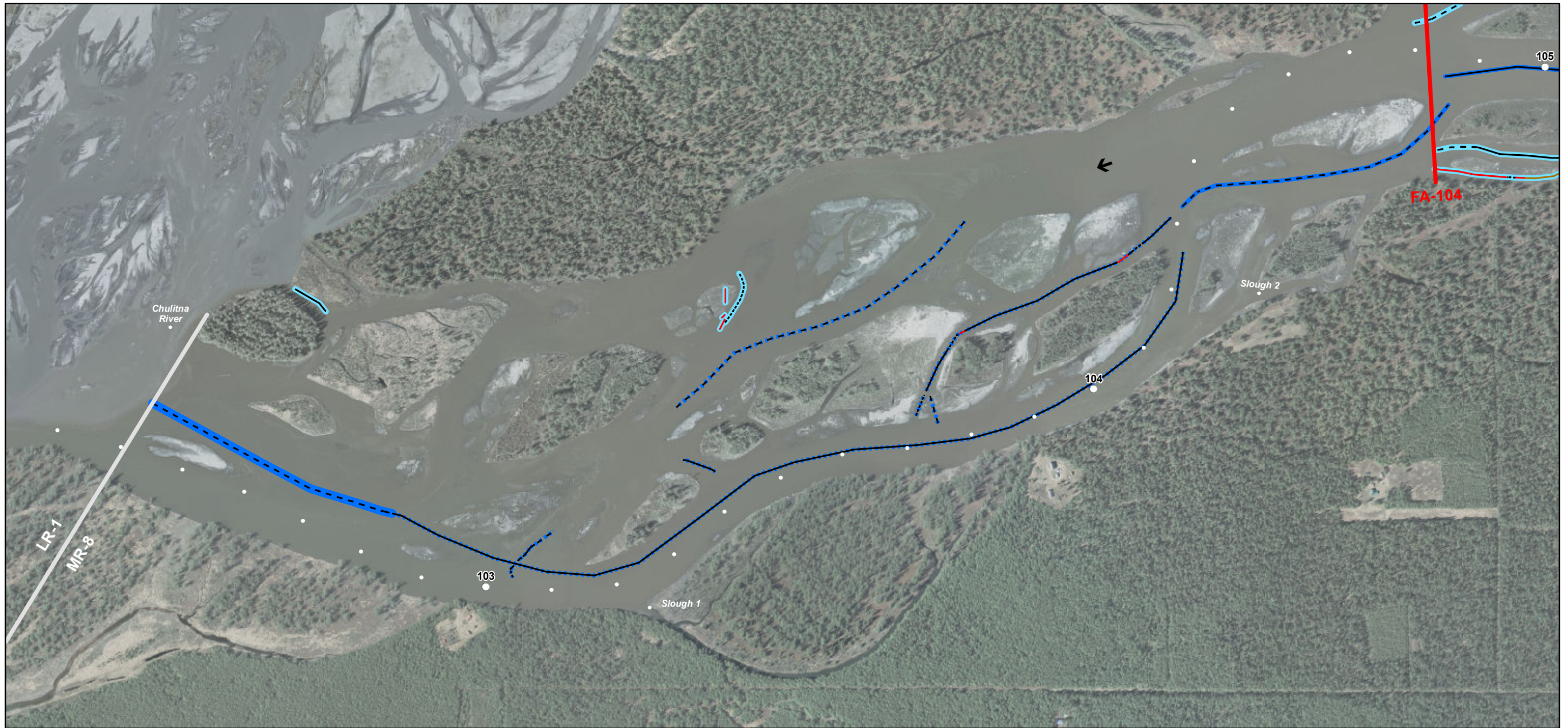
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0 1,000 Feet

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