

Susitna-Watana Hydroelectric Project Document

ARLIS Uniform Cover Page

Title: Characterization and mapping of aquatic habitats (9.9), errata to Initial Study Report Part A - Appendix A, Remote line mapping, 2012	SuWa 265
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Related work(s): Cover letter to this report: Susitna-Watana Hydroelectric Project, FERC Project no. 14241-000; Filing of Initial Study Plan Meetings transcripts and additional information in response to October 2014 Initial Study Plan Meetings. (SuWa 254) Attachments A-J (SuWa 255-264) and L-N (SuWa 266-268) Characterization and mapping of aquatic habitats, Study plan Section 9.9 : Initial study report. Appendix A (SuWa 223, Section 9.9)	Pages added/changed by ARLIS: Added cover letter (4 pages)
Notes: This document replaces the entirety of Appendix A of SuWa 223, Section 9.9.	

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November 14, 2014

Ms. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Susitna-Watana Hydroelectric Project, Project No. 14241-000

**Filing of Initial Study Plan Meetings Transcripts and Additional Information in
Response to October 2014 Initial Study Plan Meetings**

Dear Secretary Bose:

By letter dated January 28, 2014, the Federal Energy Regulatory Commission (Commission or FERC) modified the procedural schedule for the preparation and review of the Initial Study Report (ISR) for the proposed Susitna-Watana Hydroelectric Project, FERC Project No. 14241 (Project).¹ As required by the Commission's January 28 letter, the Alaska Energy Authority (AEA) filed the ISR with the Commission on June 3, 2014 and conducted ISR meetings on October 15, 16, 17, 21, 22, and 23, 2014. Attached as Attachments A-1 through F-2 are the written transcripts (along with the agenda and PowerPoint presentations) for these ISR meetings.

During the October ISR meetings, AEA and licensing participants identified certain technical memoranda and other information that AEA would file with the Commission by November 15, 2014. In accordance, AEA is filing and distributing the following technical memoranda and other information:

- Attachment G: *Glacier and Runoff Changes (Study 7.7) and Fluvial Geomorphology (Study 6.5) - Assessment of the Potential for Changes in Sediment Delivery to Watana Reservoir Due to Glacial Surges Technical Memorandum*. This technical memorandum documents AEA's analysis of the potential changes to sediment delivery from the upper Susitna watershed into the Project's reservoir from glacial surges.
- Attachment H: *Riparian Instream Flow (Study 8.6) and Fluvial Geomorphology (Study 6.6) - Dam Effects on Downstream Channel and Floodplain Geomorphology and Riparian Plant Communities and Ecosystems – Literature Review Technical Memorandum*. This literature review technical

¹ Letter from Jeff Wright, FERC Office of Energy Projects, to Wayne Dyok, Alaska Energy Authority, Project No. 14241-000 (issued Jan. 28, 2014).

memorandum synthesizes historic physical and biologic data for the Susitna River floodplain vegetation (including 1980s studies), studies of hydro project impacts on downstream floodplain plant communities, and studies of un-impacted floodplain plant community successional processes.

- Attachment I: *Susitna River Fish Distribution and Abundance Implementation Plan, Appendix 3. Protocol for Site-Specific Gear Type Selection, Version 5.* In accordance with the fish distribution and abundance studies, as described in Revised Study Plan (RSP) Sections 9.5 and 9.6 and in the Fish Distribution and Abundance Implementation Plan, this appendix establishes the protocol for site-specific gear type selection for fish surveys. Throughout study plan implementation, AEA has updated this appendix as needed to provide consistent direction to all field teams. Version 1 of Appendix 3 was originally filed with the Fish Distribution and Abundance Implementation Plan in March 2013. That version was updated twice (Versions 2 and 3) during the 2013 field season to accommodate protocol changes that related to FERC's April 1, 2013 Study Plan Determination, field permits, and lessons learned during study implementation. Version 4 was the protocol used for the 2014 field season and was updated with respect to the prioritization of gear use and based on 2013 data collected. This version herein, Version 5, will be followed during the 2015 field season.
- Attachment J: *Fish Distribution and Abundance in the Upper and Middle/Lower Susitna River (Studies 9.5 and 9.6): Draft Chinook and Coho Salmon Identification Protocol.* This document established a Chinook and coho salmon identification protocol to support accurate and consistent field identification across field teams. It will allow for additional quality control and assurance of field identification calls and for estimation and reporting of any field identification error that may occur in future sampling efforts.
- Attachment K: *Characterization and Mapping of Aquatic Habitats (9.9), Errata to Initial Study Report Part A - Appendix A, Remote Line Mapping, 2012.* This errata provides a corrected version of map book for Remote Line Mapping, 2012. The version filed with the ISR (June 3, 2014) used a data query to build the maps in geomorphic reaches MR-1 to UR-5 that mistakenly did not include side slough habitat, so that no side sloughs were depicted on the Appendix A maps 1 through 21. This version was corrected by including side slough habitat in the data query for geomorphic reaches MR-1 to UR-5. This version now includes side sloughs.
- Attachment L: *Characterization and Mapping of Aquatic Habitats Study 9.9, Revised Map Book for 2012 Remote Line Mapping.* This map book represents an update to the version published on June 3, 2014 with the Study 9.9 Initial Study Report and the errata provided concurrently with this filing (see Attachment K). The maps presented include all macrohabitat and mesohabitat line identifications available in the 2012 Remote Line Mapping ArcGIS

shapefile. This map book should be considered a full replacement for previous versions and represents the final product for the 2012 remote line habitat mapping effort.

- Attachment M: *Study of Fish Passage Barriers in the Middle and Upper Susitna River and Susitna Tributaries (Study 9.12), Fish Passage Criteria Technical Memorandum*. This technical memorandum presents a proposed final list of fish species that will be included in the fish barrier analysis as well as depth, leaping and velocity passage criteria for selected fish species. AEA previously consulted with the federal agencies and other licensing participants regarding the information within the technical memorandum during a March 19, 2014 Fisheries Technical Meeting.

In addition to the technical memoranda and other information identified above, AEA is filing a short errata (Attachment N) to the *Mercury Assessment and Potential for Bioaccumulation Study (Study 5.7), Evaluation of Continued Mercury Monitoring Beyond 2014 Technical Memorandum*. This technical memorandum, which was originally filed on September 30, 2014, evaluates the need for continued monitoring of mercury data beyond 2014 and whether the existing data collection efforts are sufficient to satisfy objectives for characterizing baseline mercury conditions in the Susitna River and tributaries (RSP Section 5.7.1). Since the filing of this TM and based upon the ongoing QA/QC of the data reported in that TM, AEA discovered errors in the TM. The attached TM corrects those errors. Additionally, the errata corrects corresponding errors in the Mercury Assessment and Potential for Bioaccumulation presentation presented during the October 16, 2014 ISR meeting.

Finally, AEA notes that data collected during the Study Plan implementation, to the extent they have been verified through AEA's quality assurance and quality control (QAQC) procedures and are publicly available, can be accessed at http://gis.suhydro.org/isr_mtg. On November 14, 2014, AEA posted the following data to this website:

- *Baseline Water Quality Data (Study 5.5)*, 2013 QAQC water quality data and DVRs per the Quality Assurance Project Plan.
- *Breeding Survey Study of Landbirds and Shorebirds (Study 10.16)*, cumulative 2013-2014 data.
- *Characterization and Mapping of Aquatic Habitats (Study 9.9)*, ArcGIS shapefile "ISR_9_9_AQHAB_RemoteLineMapping_2012.shp" used to generate the maps in Attachment L.

AEA appreciates the opportunity to provide this additional information to the Commission and licensing participants, which it believes will be helpful in determining the appropriate development of the 2015 study plan as set forth in the ISR. If you have questions concerning this submission please contact me at wdyok@aidea.org or (907) 771-3955.

Sincerely,

A handwritten signature in cursive script that reads "Wayne M. Dyok". The signature is written in dark ink and is positioned above the printed name.

Wayne Dyok
Project Manager
Alaska Energy Authority

Attachments

cc: Distribution List (w/o Attachments)

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

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

**Errata to Initial Study Report
Part A - Appendix A, Remote Line Mapping, 2012**

Prepared for

Alaska Energy Authority



SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Prepared by

R2 Resource Consultants, Inc.

November 2014

ERRATA TO INITIAL STUDY REPORT, PART A – APPENDIX A (June 3, 2014)

Part A Reference	Description
9.8 ISR Appendix A	Corrected version of map book for Remote Line Mapping, 2012. The version filed with the ISR (June 3, 2014) was converted to a PDF from two GIS shapefiles. The first shapefile contained habitat data for MR-1 to UR-5 and the subsequent data query used to build the maps included in the ISR did not include side slough habitat. The second shapefile contained habitat data for UR-4 to UR-1 and the data query used to build maps for these geomorphic reaches had the correct data query and thus included side sloughs. The result was that digitized side sloughs were not depicted on Appendix A maps 1 through 21 but were represented on maps 22 through 27. This version was corrected by converting the same GIS files to PDF with all layers turned on; thus, this version now includes side sloughs.

APPENDIX A: REMOTE LINE MAPPING, 2012

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

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

**Part A - Appendix A
Remote Line Mapping, 2012**

Initial Study Report

Prepared for

Alaska Energy Authority



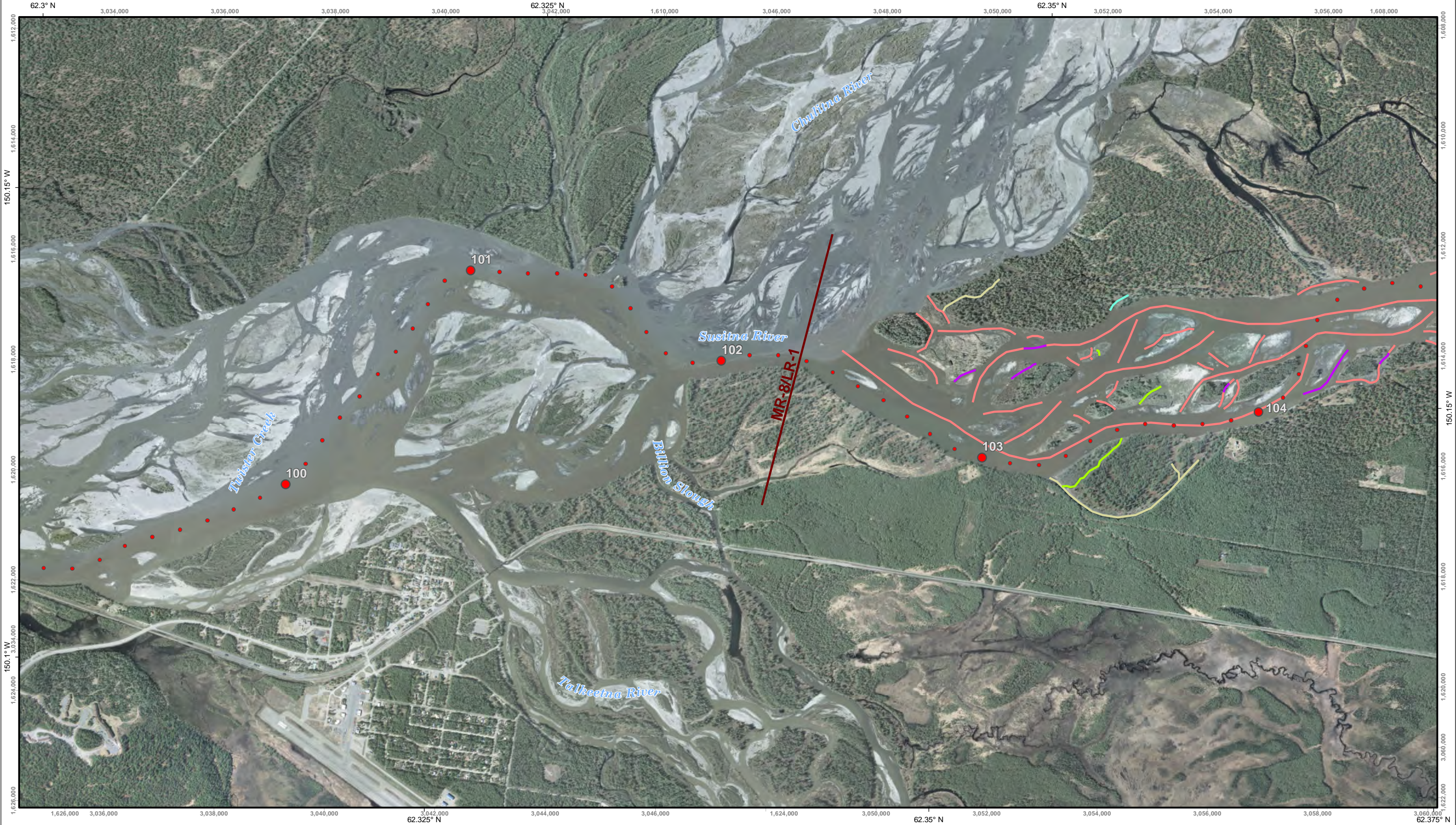
Prepared by

R2 Resource Consultants, Inc.

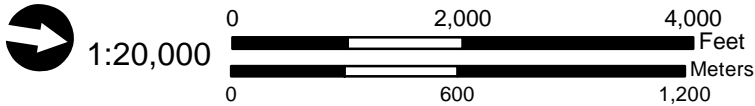
November 2014

INTRODUCTION

The maps contained in this map book were created using several sources of remote imagery in 2012. The habitat typing is consistent with the terminology that was current at that time, but has undergone refinement through 2013. In addition, an exercise to compare remote habitat typing with ground-based surveys conducted in 2013 is ongoing at the time of the publication of this ISR. Once this exercise is complete, final map books will be made that include both refinements of habitat definitions and typing.

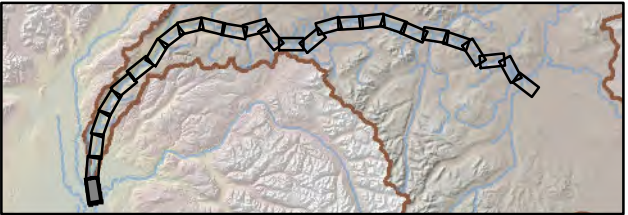


Susitna - Watana Hydroelectric Project
Fish Barrier and Aquatic Habitat Field Survey Map Book

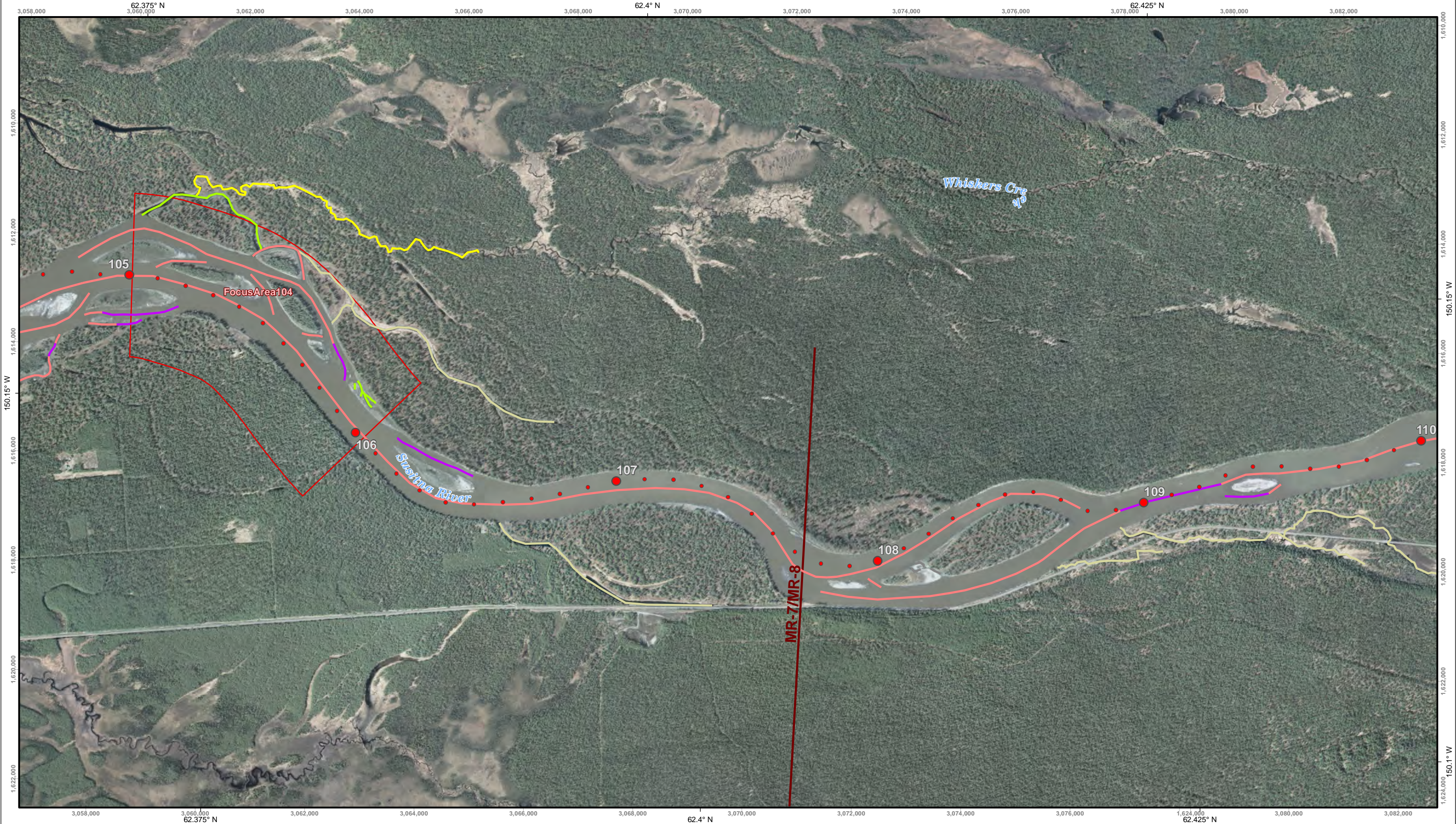


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Grid Interval: 2000'

General Features			
●	Susitna Project River Miles	—	Mesohabitats
—	Susitna Geomorphic Reach Breaks	—	Glide or Run
□	Focus Area	—	Pool
		—	Rapid
		—	Riffle
		—	Macrohabitats
		—	Side Slough
		—	Tributary
		—	Unidentified
		—	Upland Slough
		—	Special Habitat Features
		—	Backwater
		—	Beaver Complex



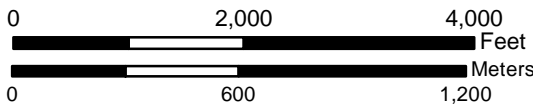
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Susitna - Watana Hydroelectric Project
Fish Barrier and Aquatic Habitat Field Survey Map Book



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Map Projection: NAD83 State Plane Zone 4 (Feet)
Grid Interval: 2000'

General Features

- Susitna Project River Miles
- Susitna Geomorphic Reach Breaks
- Focus Area

Mesohabitats

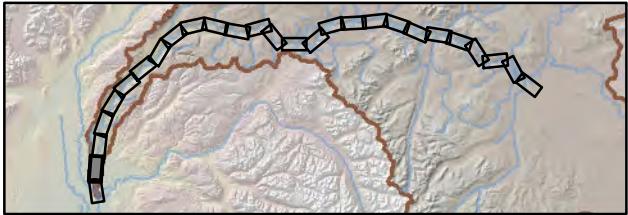
- Glide or Run
- Pool
- Rapid
- Riffle

Macrohabitats

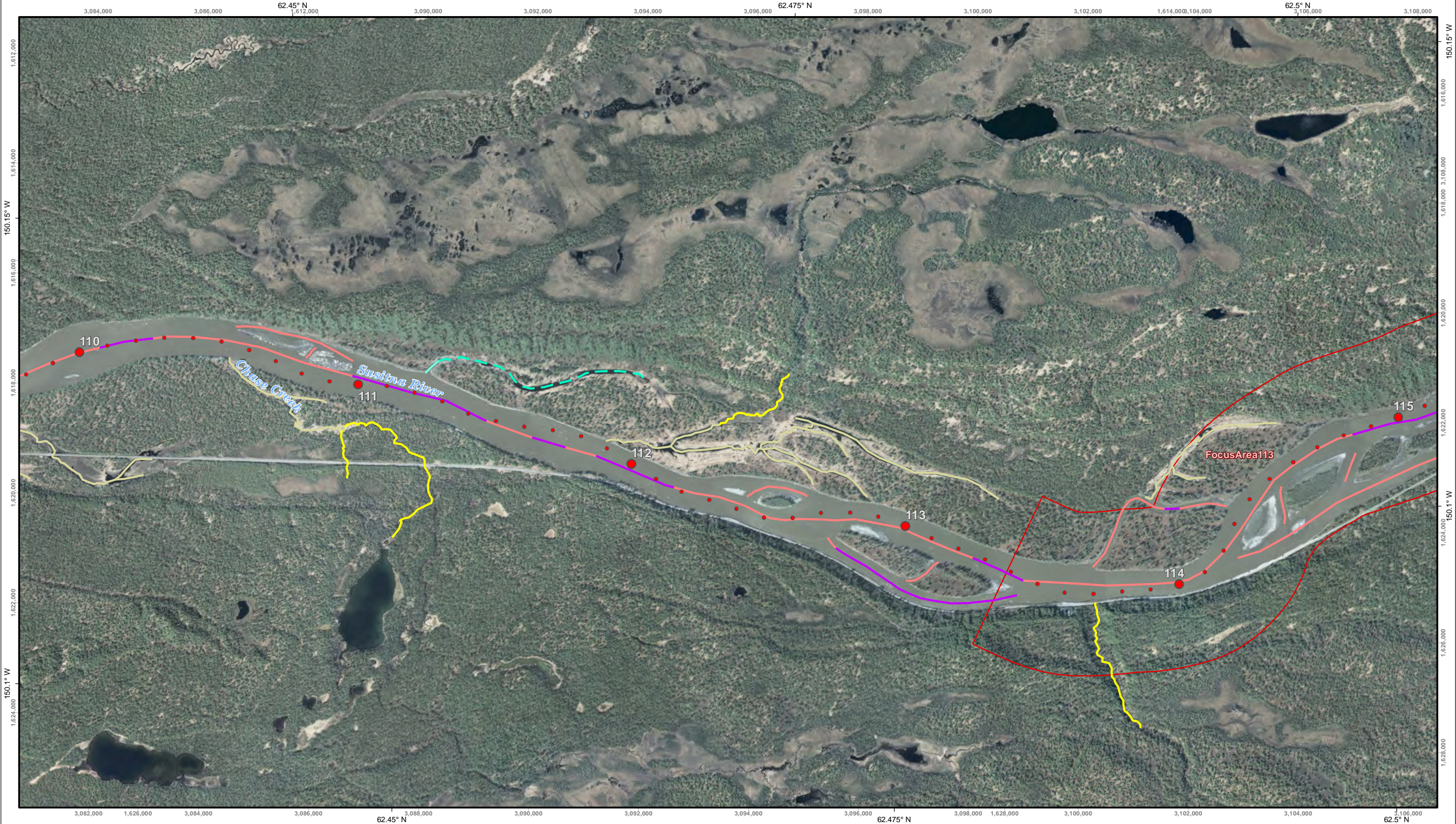
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- Upland Slough

Special Habitat Features

- Backwater
- Beaver Complex



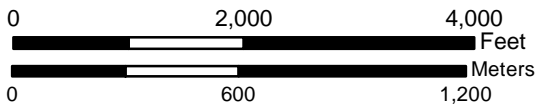
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Susitna - Watana Hydroelectric Project
Fish Barrier and Aquatic Habitat Field Survey Map Book



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Map Projection: NAD83 State Plane Zone 4 (Feet)
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General Features

- Susitna Project River Miles
- Susitna Geomorphic Reach Breaks
- Focus Area

Mesohabitats

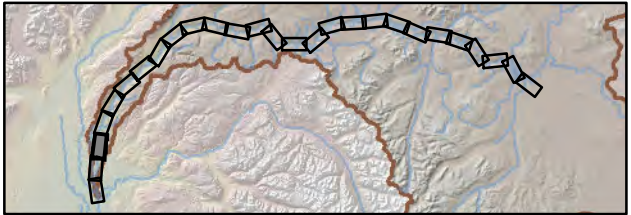
- Glide or Run
- Pool
- Rapid
- Riffle

Macrohabitats

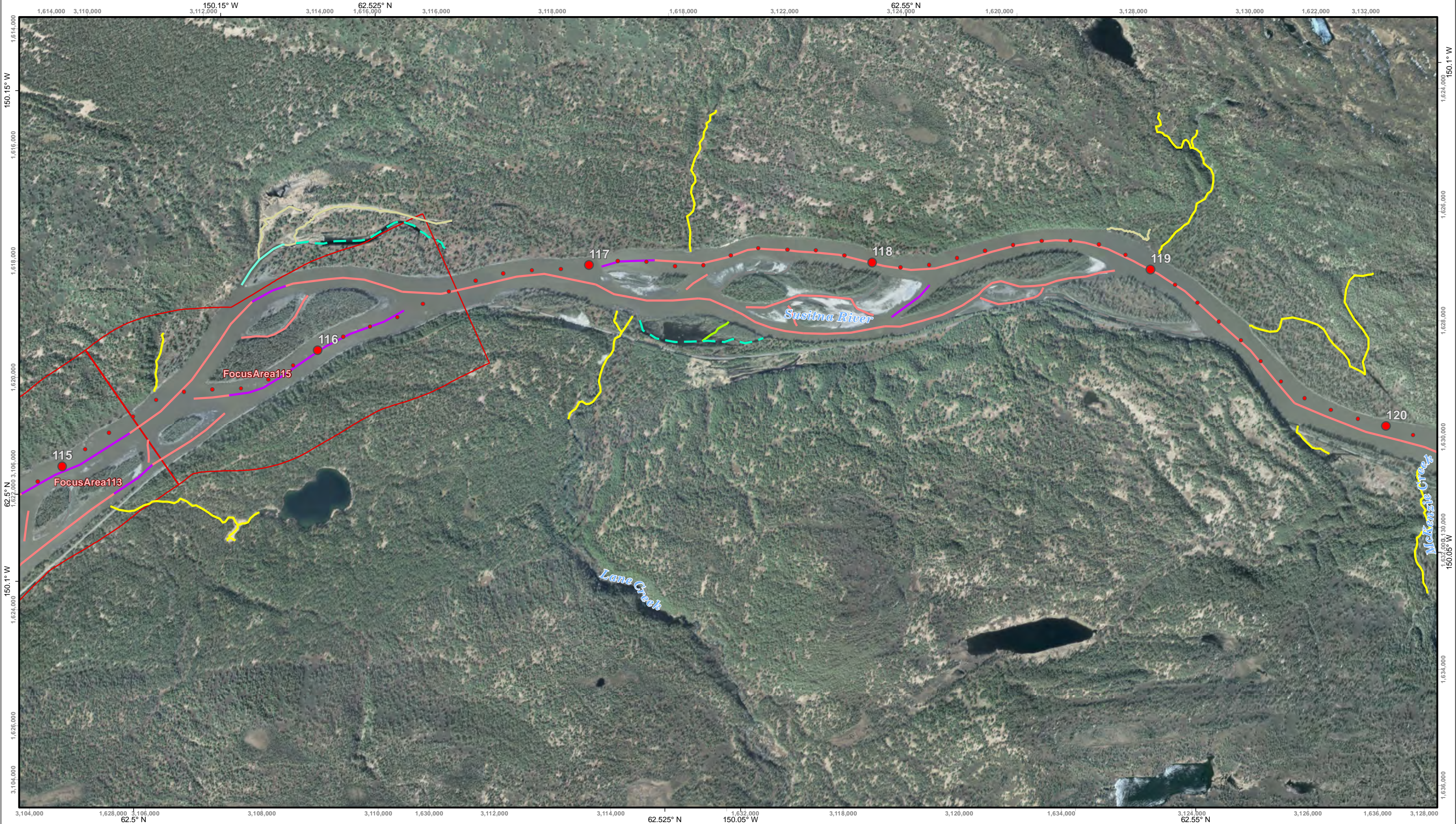
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- Unidentified
- Upland Slough

Special Habitat Features

- Backwater
- Beaver Complex



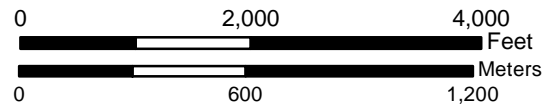
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Susitna - Watana Hydroelectric Project
Fish Barrier and Aquatic Habitat Field Survey Map Book



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Map Projection: NAD83 State Plane Zone 4 (Feet)
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General Features

- Susitna Project River Miles
- Susitna Geomorphic Reach Breaks
- Focus Area

Mesohabitats

- Glide or Run
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Macrohabitats

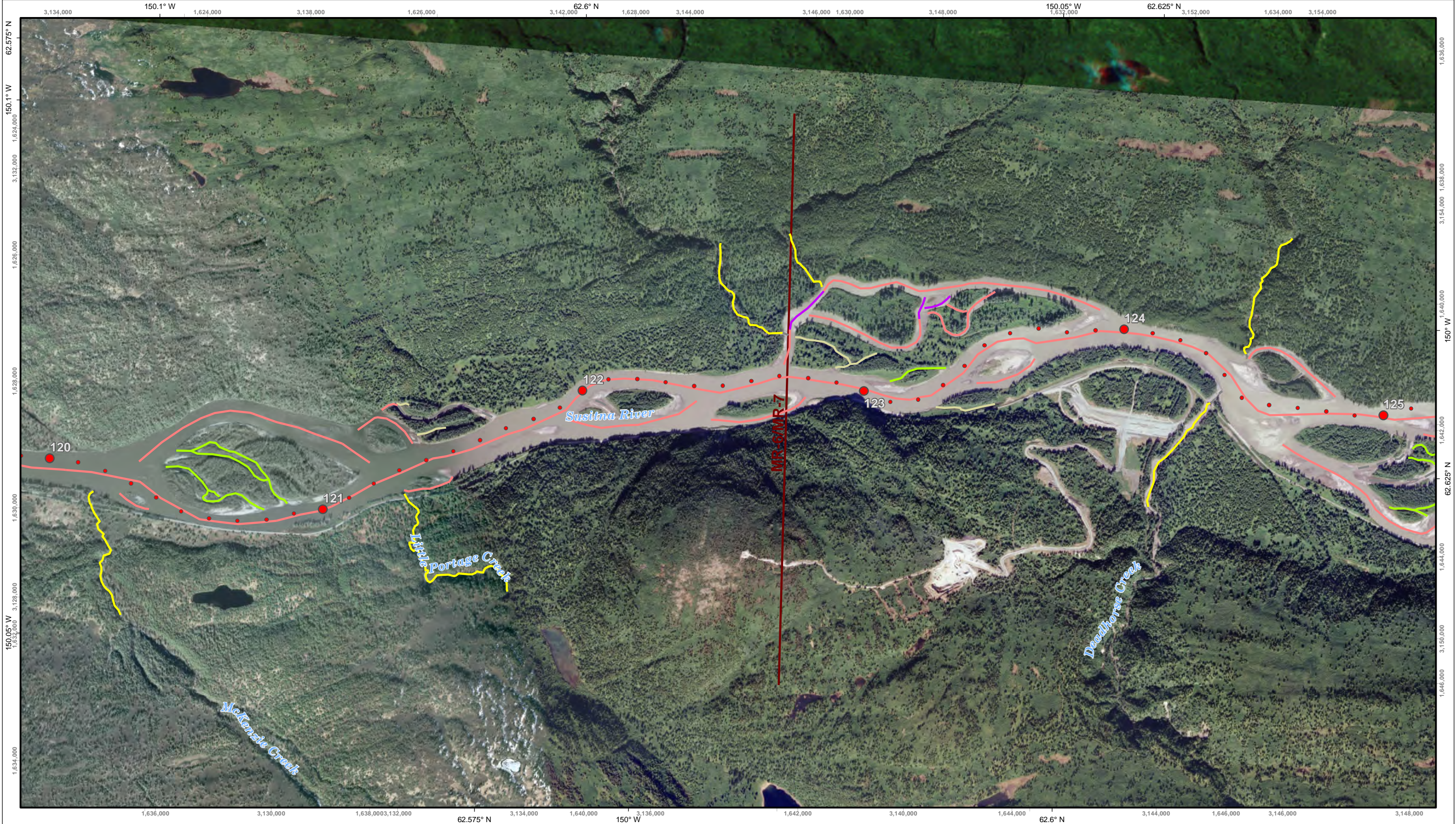
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Special Habitat Features

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Susitna - Watana Hydroelectric Project

Fish Barrier and Aquatic Habitat Field Survey Map Book

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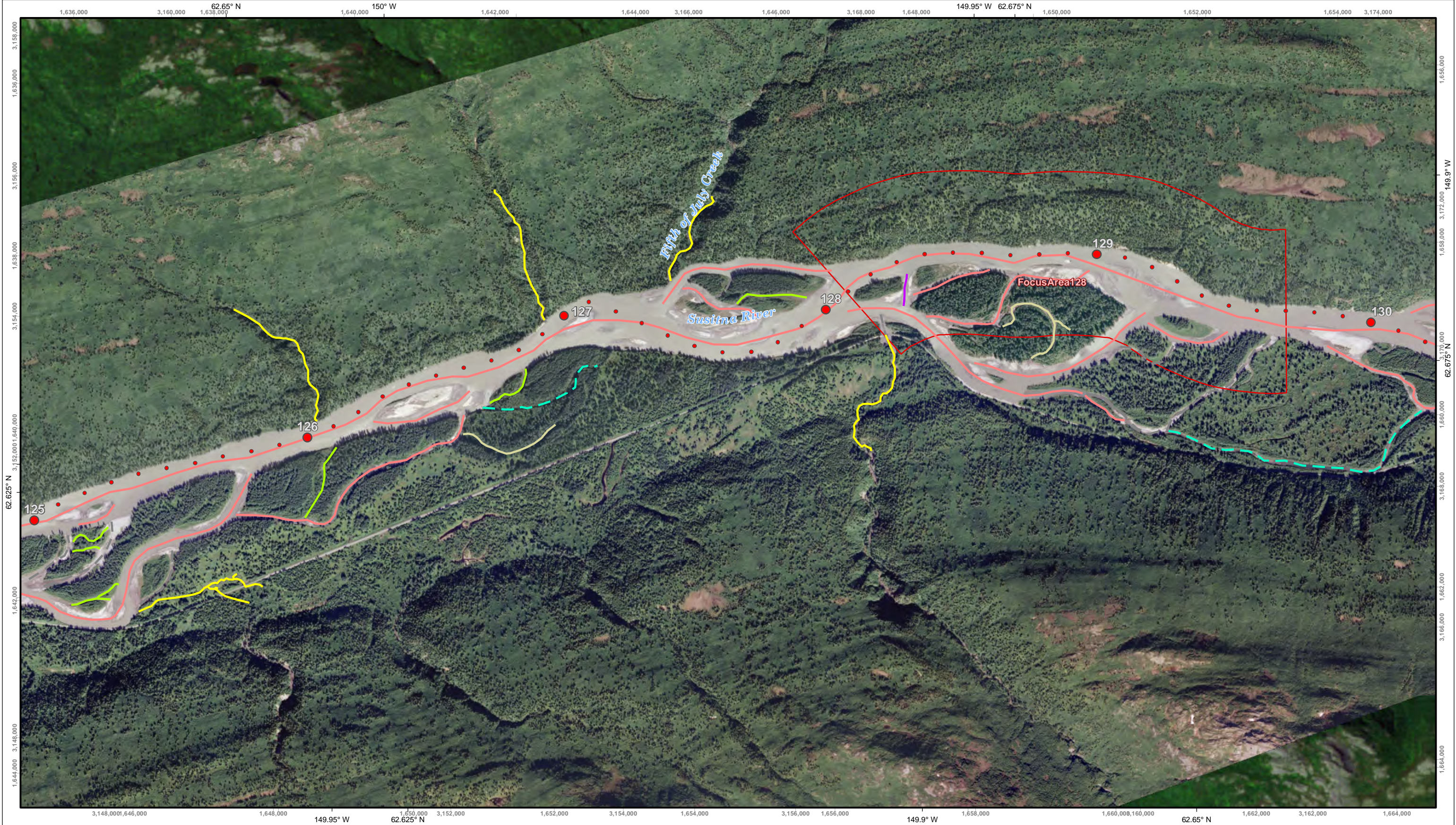
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		<div></div>	Riffle
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		<div></div>	Backwater
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ALASKA

ENERGY AUTHORITY

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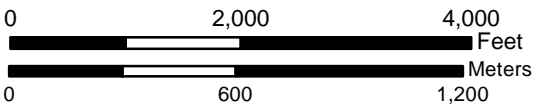
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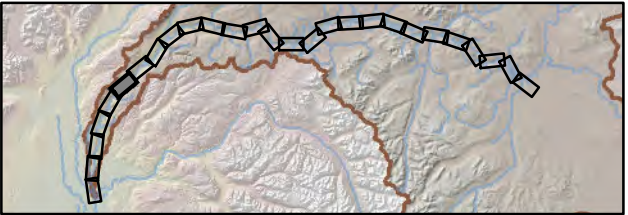


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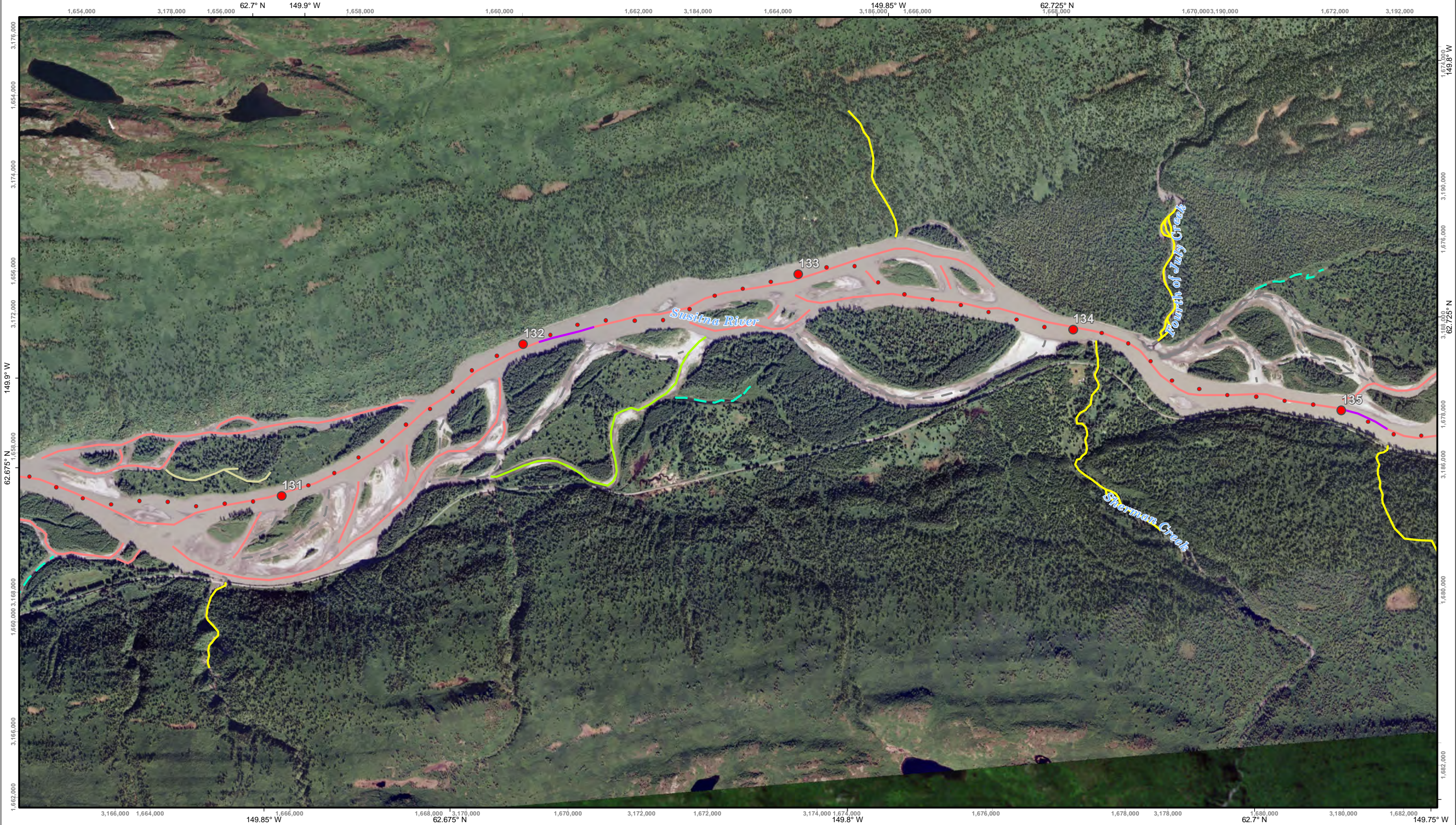


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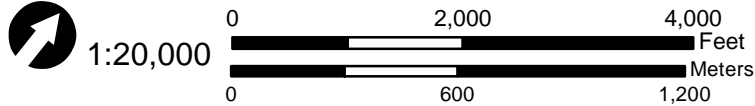
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—	Susitna Geomorphic Reach Breaks	—	Pool
□	Focus Area	—	Rapid
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		—	Side Slough
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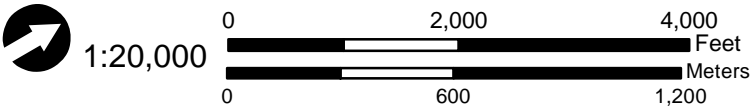
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 Focus Area	— Pool	— Tributary	— Backwater
	— Rapid	— Unidentified	— Beaver Complex
	— Riffle	— Upland Slough	



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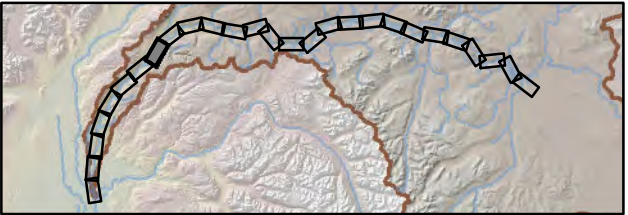


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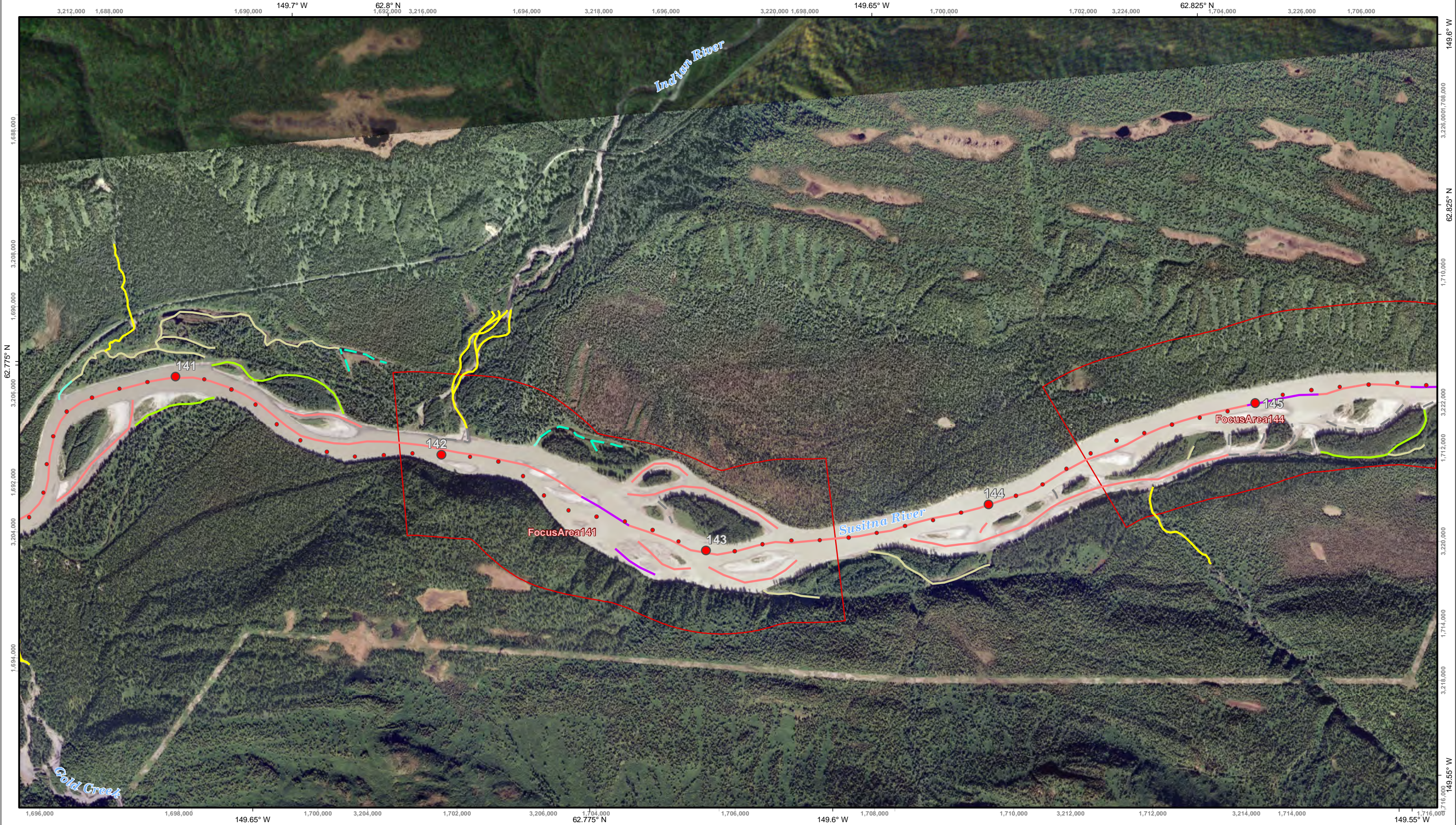


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General Features			
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—	Susitna Geomorphic Reach Breaks	—	Glide or Run
	Focus Area	—	Pool
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		—	Riffle
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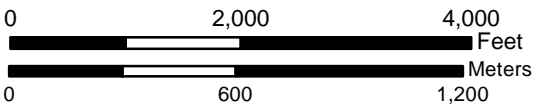
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Map Projection: NAD83 State Plane Zone 4 (Feet)
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General Features

- Susitna Project River Miles
- Susitna Geomorphic Reach Breaks
- Focus Area

Mesohabitats

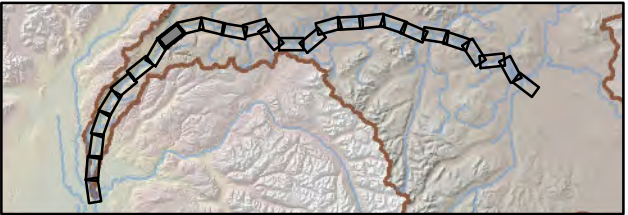
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- Riffle

Macrohabitats

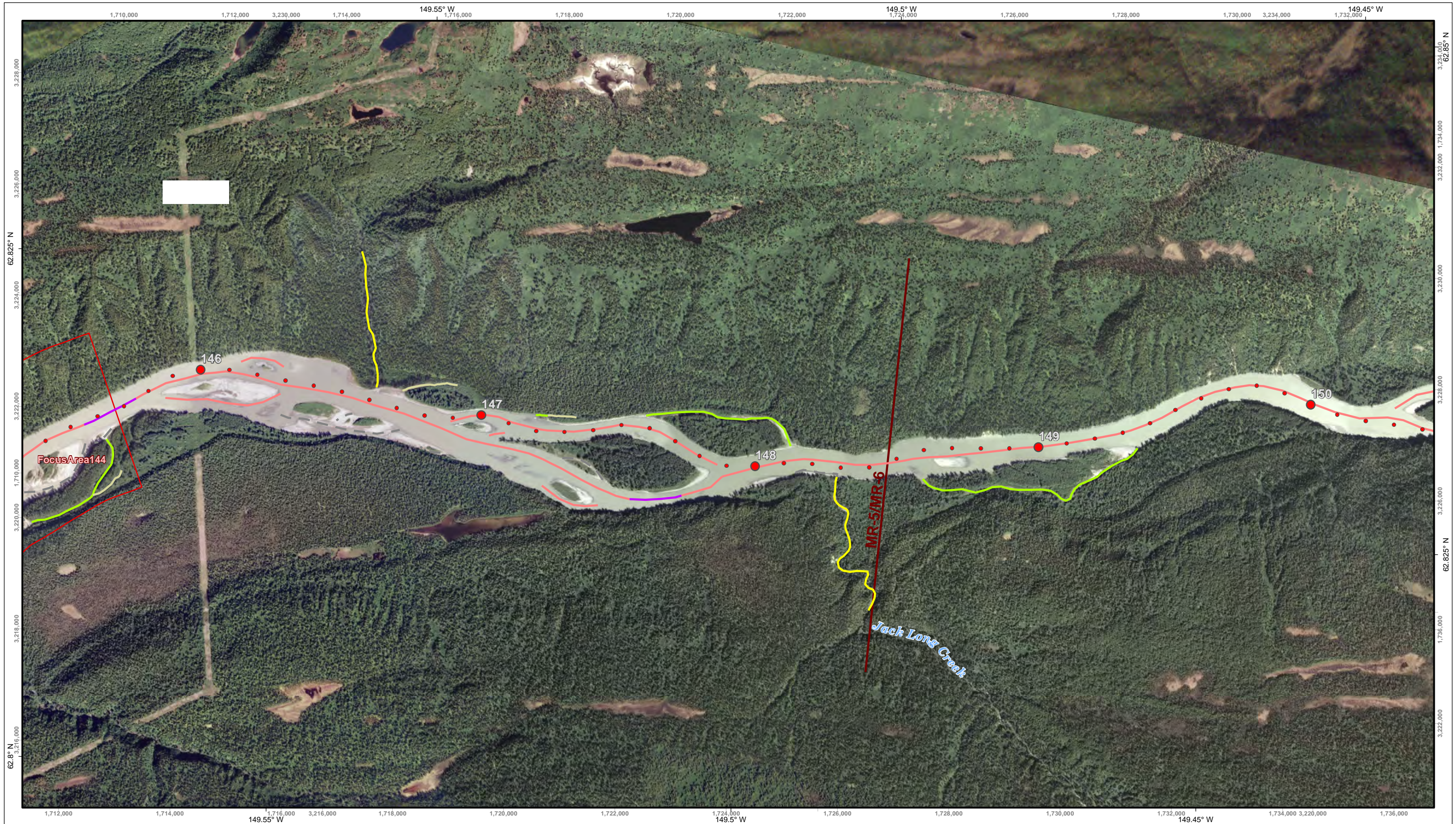
- Side Slough
- Tributary
- Unidentified
- Upland Slough

Special Habitat Features

- Backwater
- Beaver Complex



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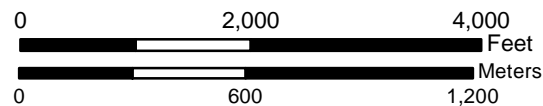


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Fish Barrier and Aquatic Habitat Field Survey Map Book



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Map Projection: NAD83 State Plane Zone 4 (Feet)
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General Features

- Susitna Project River Miles
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Mesohabitats

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Macrohabitats

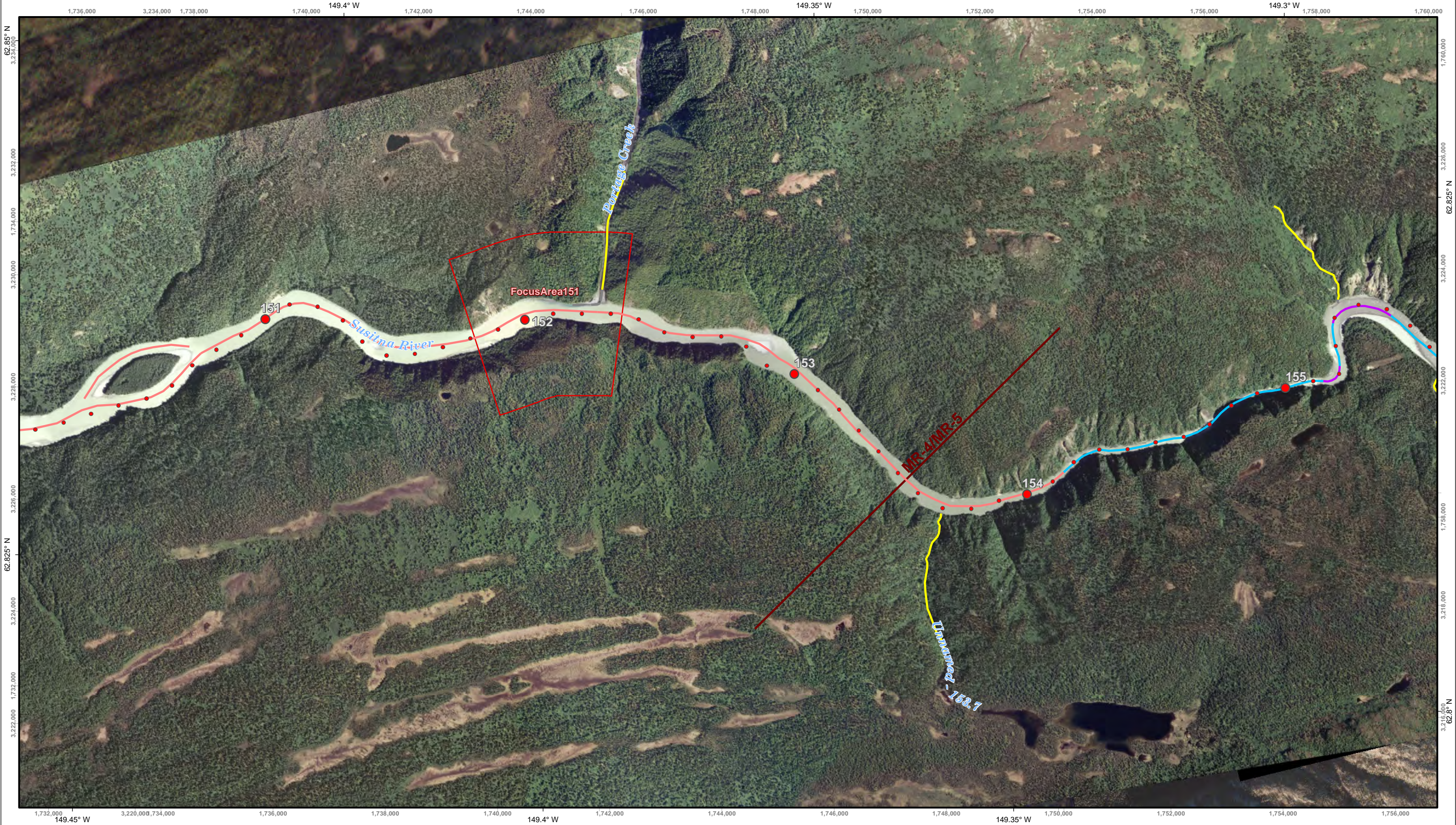
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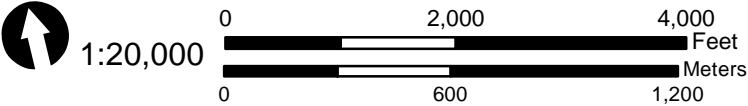
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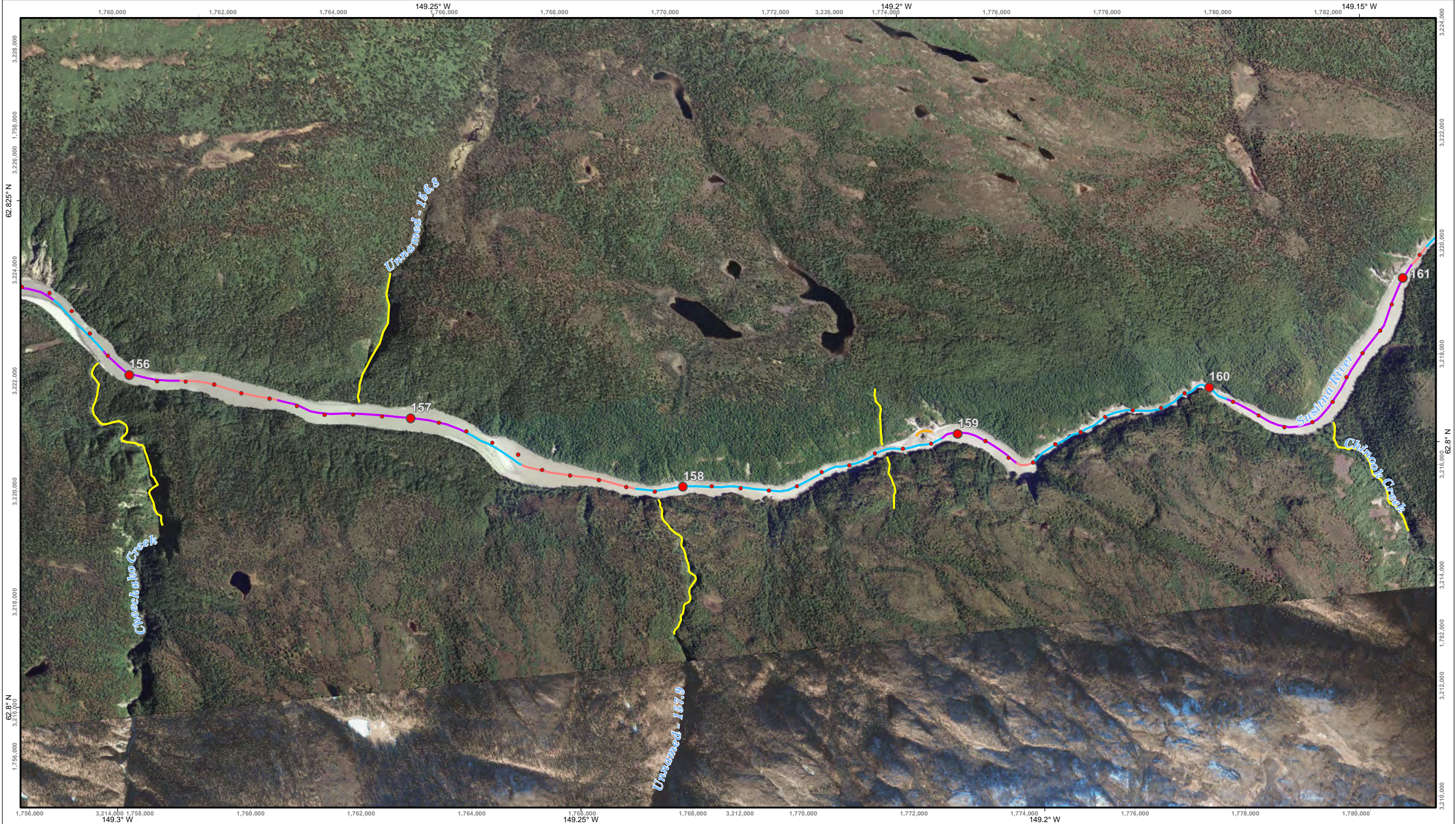


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General Features			
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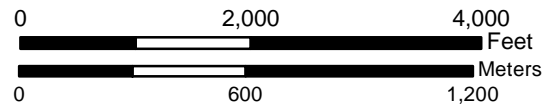
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Fish Barrier and Aquatic Habitat Field Survey Map Book



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Map Projection: NAD83 State Plane Zone 4 (Feet)
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General Features

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Mesohabitats

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Macrohabitats

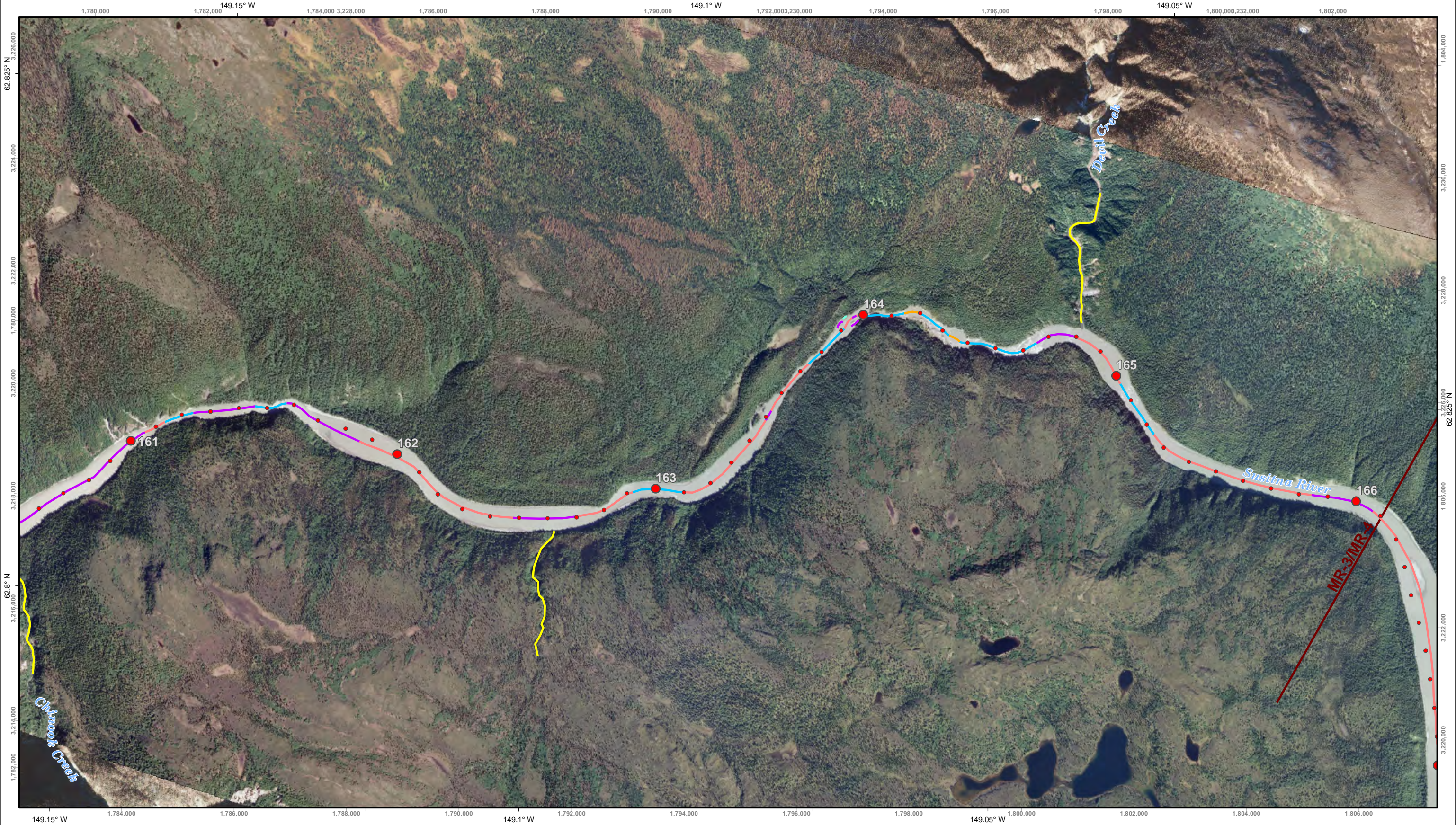
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Special Habitat Features

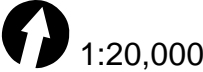
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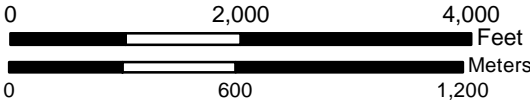
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Map Projection: NAD83 State Plane Zone 4 (Feet)
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Macrohabitats

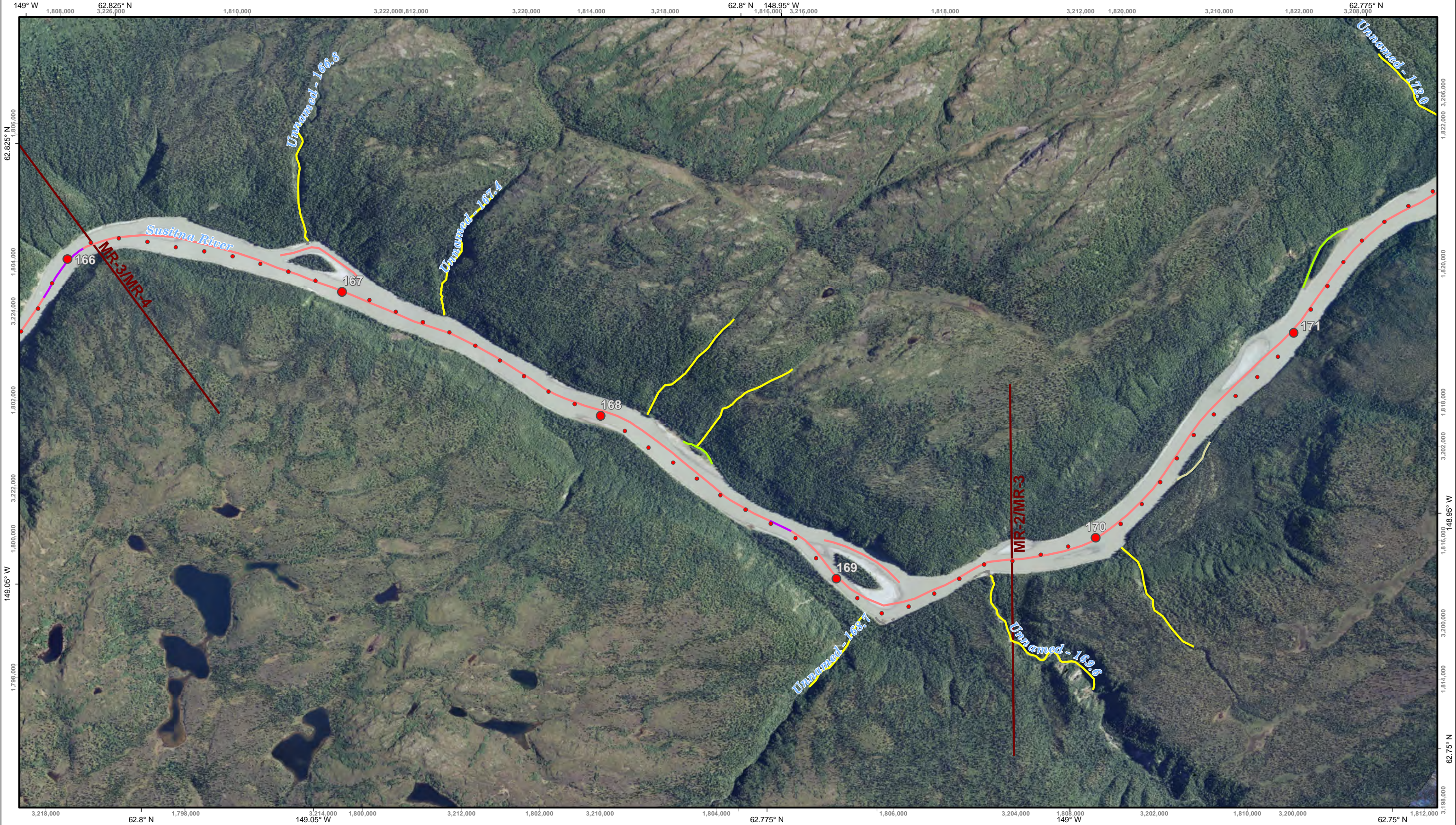
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Special Habitat Features

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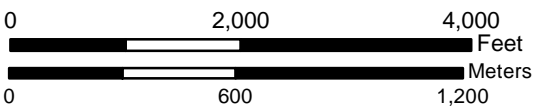
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Susitna - Watana Hydroelectric Project
Fish Barrier and Aquatic Habitat Field Survey Map Book



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Map Projection: NAD83 State Plane Zone 4 (Feet)
Grid Interval: 2000'

General Features

- Susitna Project River Miles
- Susitna Geomorphic Reach Breaks
- Focus Area

Mesohabitats

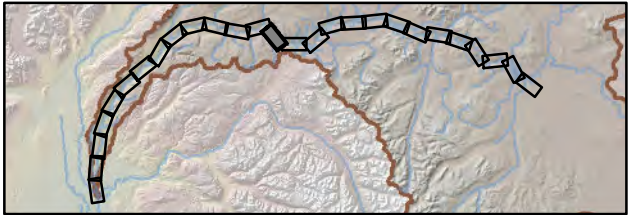
- Glide or Run
- Pool
- Rapid
- Riffle

Macrohabitats

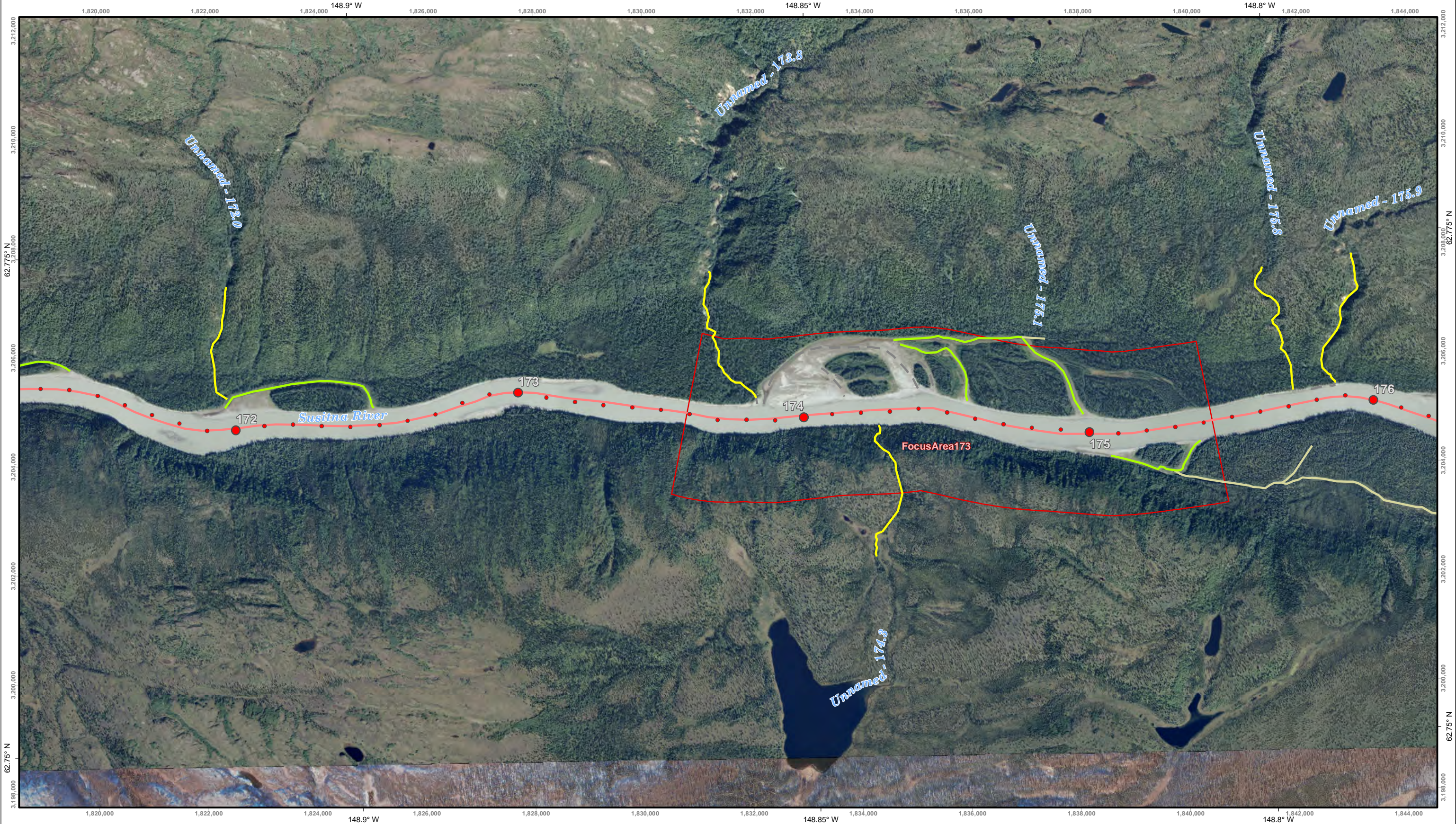
- Side Slough
- Tributary
- Unidentified
- Upland Slough

Special Habitat Features

- Backwater
- Beaver Complex



Date Created: 10/15/2014
Map Author: HDR Alaska - MAD
File: HDR_2012_LineMapping.mxd



Susitna - Watana Hydroelectric Project

Fish Barrier and Aquatic Habitat Field Survey Map Book

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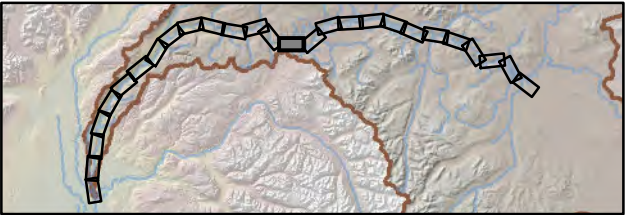
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FeetMeters

Map Projection: NAD83 State Plane Zone 4 (Feet)
Grid Interval: 2000'

General Features			
Susitna Project River Miles	Glide or Run	Side Slough	Backwater
Susitna Geomorphic Reach Breaks	Pool	Tributary	Beaver Complex
Focus Area	Rapid	Unidentified	
	Riffle	Upland Slough	



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General Features

- Susitna Project River Miles
- Susitna Geomorphic Reach Breaks
- Focus Area

Mesohabitats

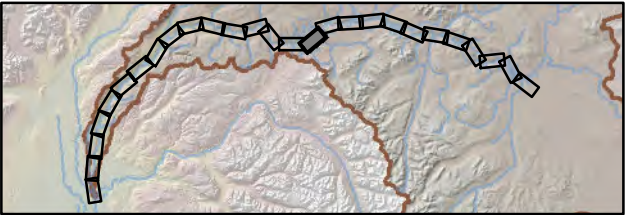
- Glide or Run
- Pool
- Rapid
- Riffle

Macrohabitats

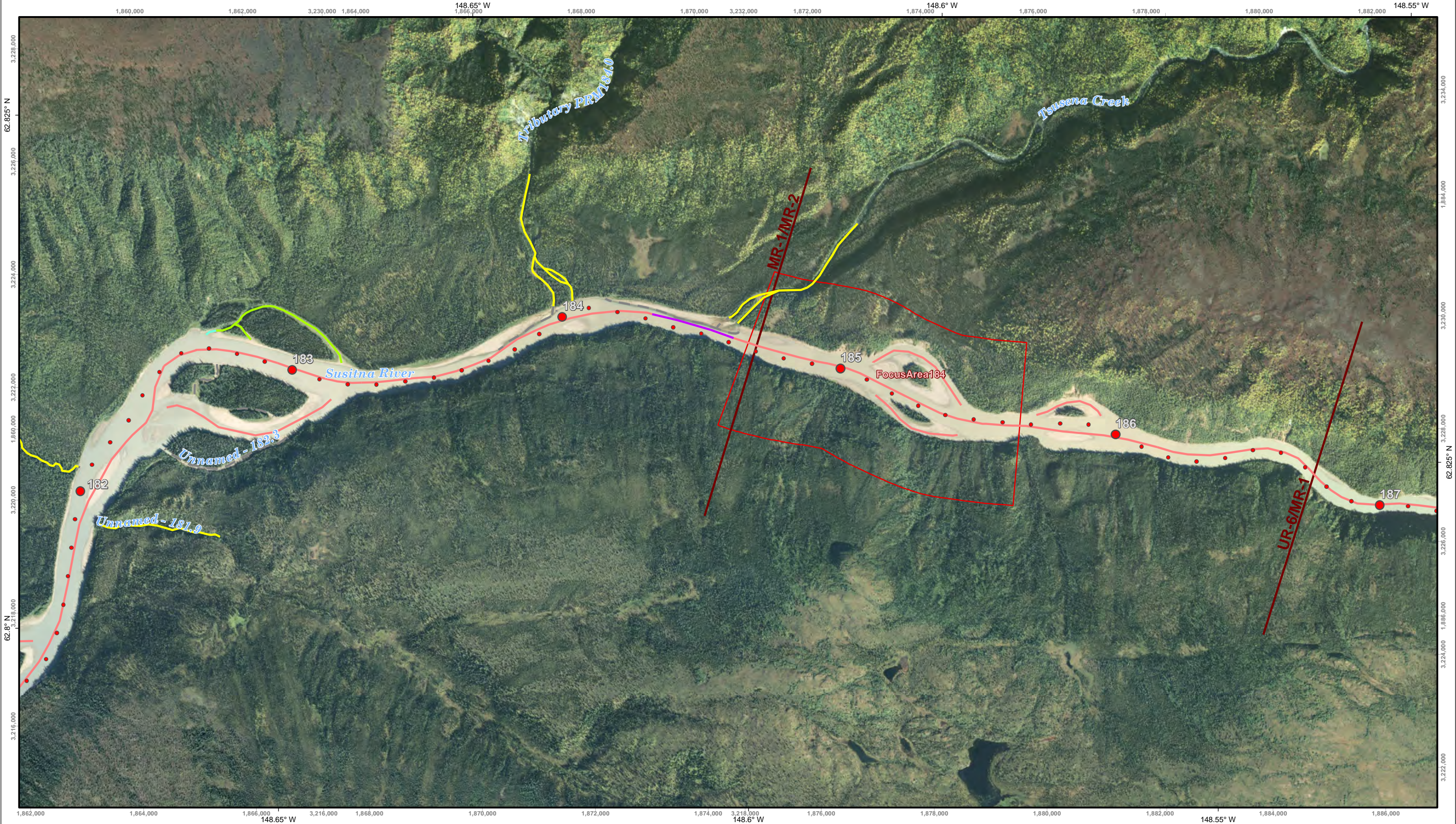
- Side Slough
- Tributary
- Unidentified
- Upland Slough

Special Habitat Features

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02,0004,000

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FeetMeters

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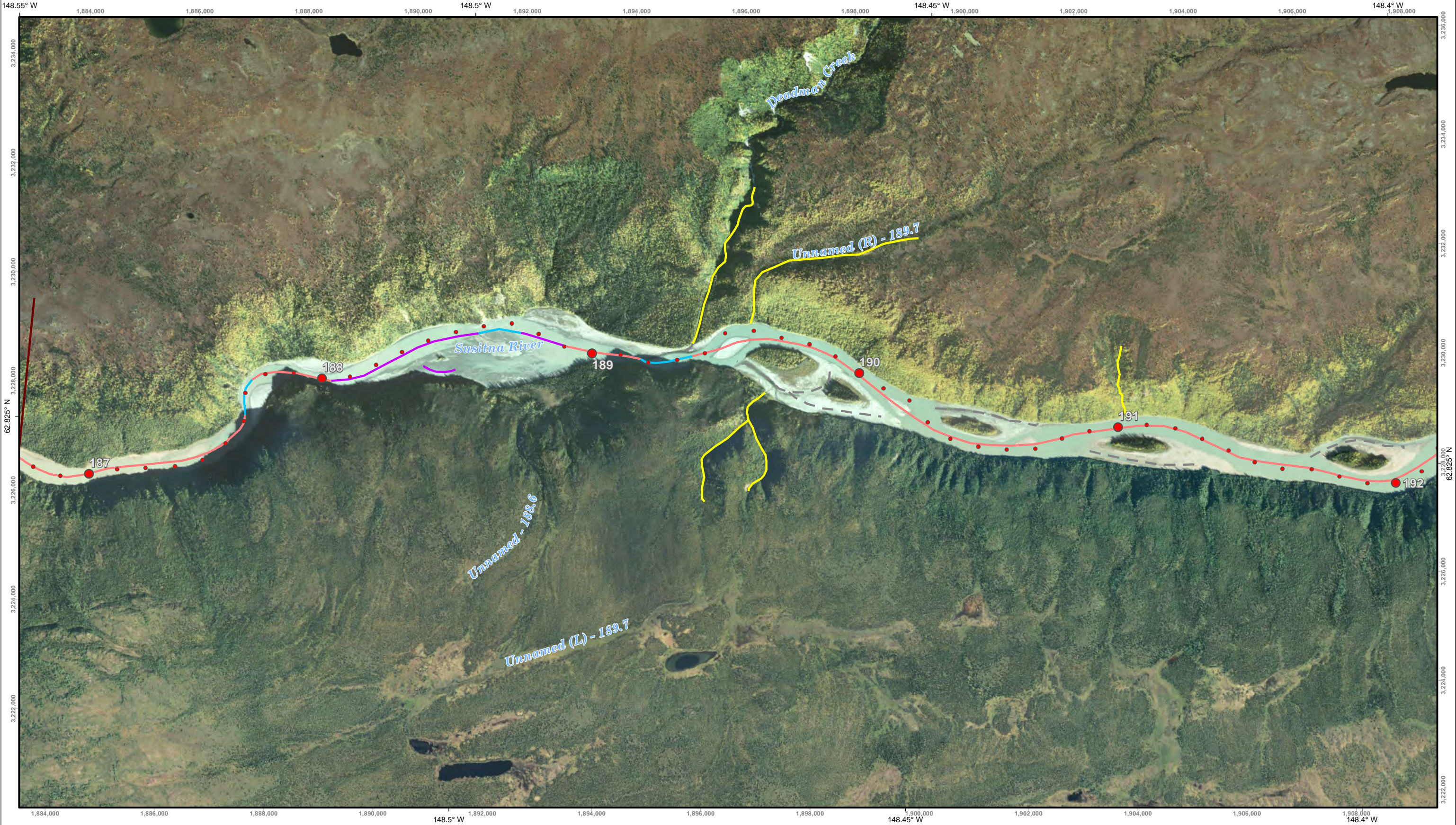
General Features			
	Susitna Project River Miles		Glide or Run
	Susitna Geomorphic Reach Breaks		Side Slough
	Focus Area		Rapid
			Riffle
			Upland Slough
			Backwater
			Beaver Complex



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02,0004,000

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Feet

Meters

Map Projection: NAD83 State Plane Zone 4 (Feet)

Grid Interval: 2000'

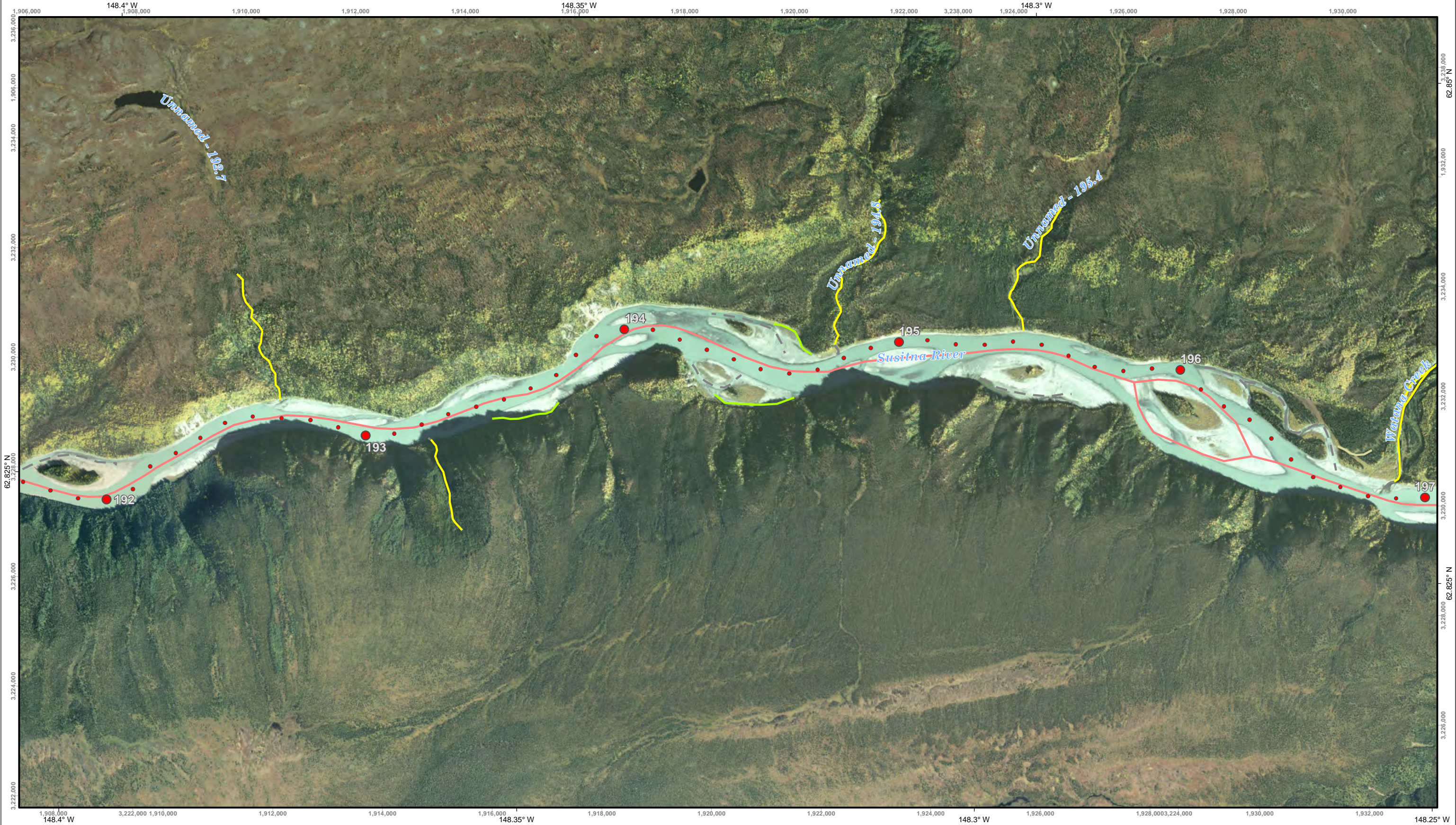
General Features			
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	Susitna Geomorphic Reach Breaks		Pool
	Focus Area		Rapid
			Riffle
			Side Slough
			Tributary
			Unidentified
			Upland Slough
			Backwater
			Beaver Complex



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General Features

- Susitna Project River Miles
- Susitna Geomorphic Reach Breaks
- Focus Area

Mesohabitats

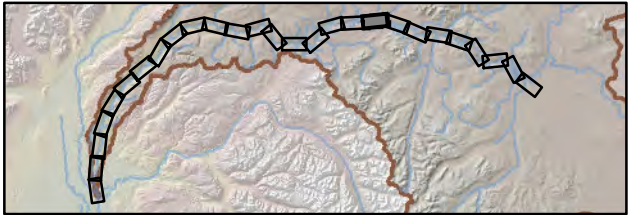
- Glide or Run
- Pool
- Rapid
- Riffle

Macrohabitats

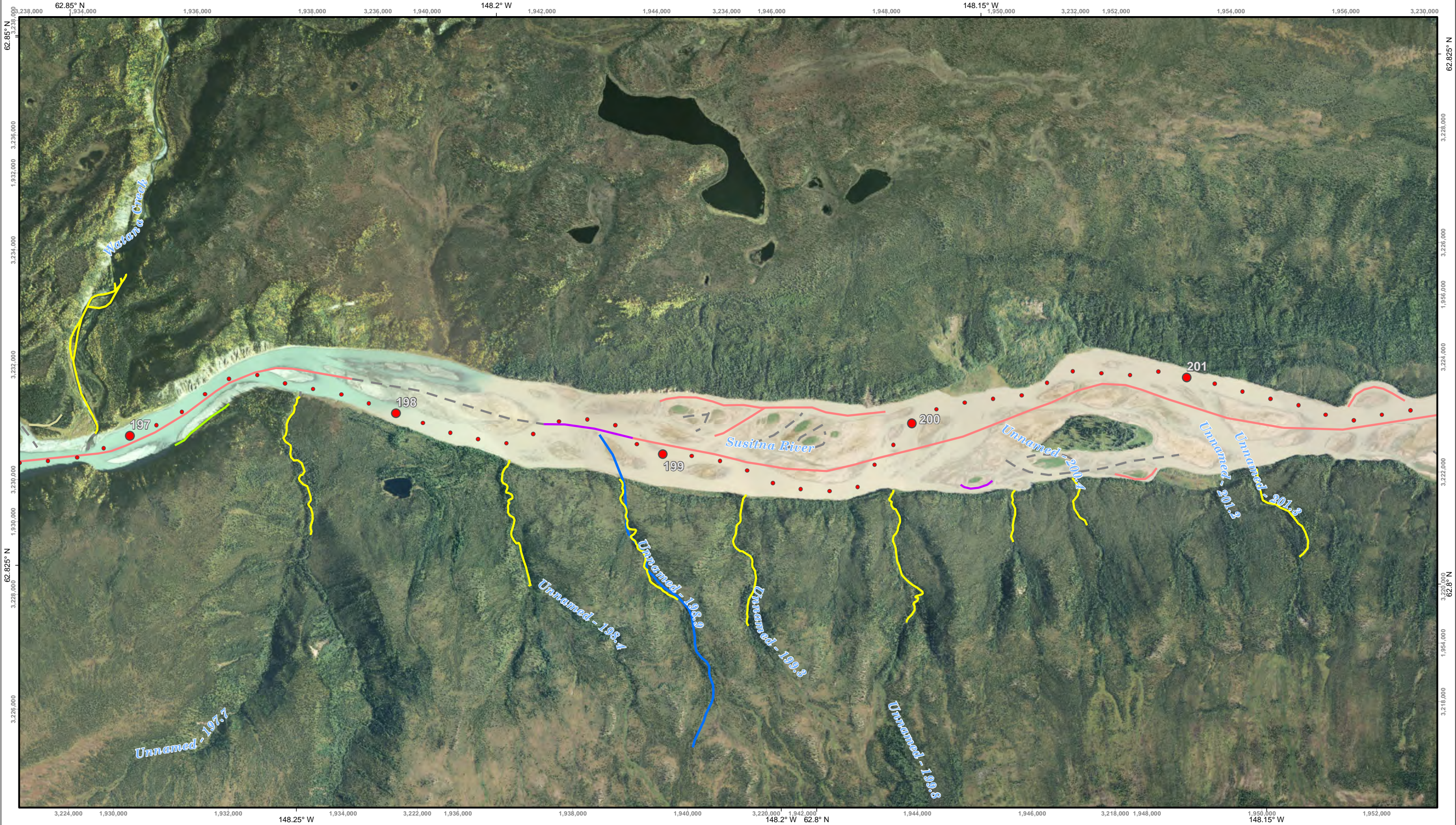
- Side Slough
- Tributary
- Unidentified
- Upland Slough

Special Habitat Features

- Backwater
- Beaver Complex



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02,0004,000

06001,200

FeetMeters

Map Projection: NAD83 State Plane Zone 4 (Feet)
Grid Interval: 2000'

General Features			
	Susitna Project River Miles		Mesohabitats
	Susitna Geomorphic Reach Breaks		Pool
	Focus Area		Rapid
			Riffle
			Side Slough
			Unidentified
			Upland Slough
			Macrohabitats
			Backwater
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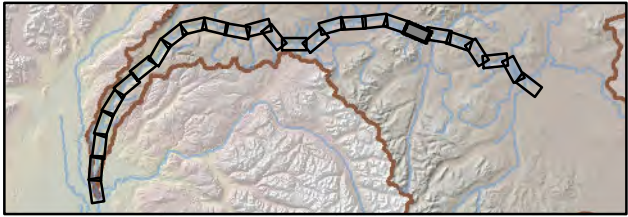
Susitna - Watana Hydroelectric Project
 Fish Barrier and Aquatic Habitat Field Survey Map Book

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0 2,000 4,000 Feet
 0 600 1,200 Meters

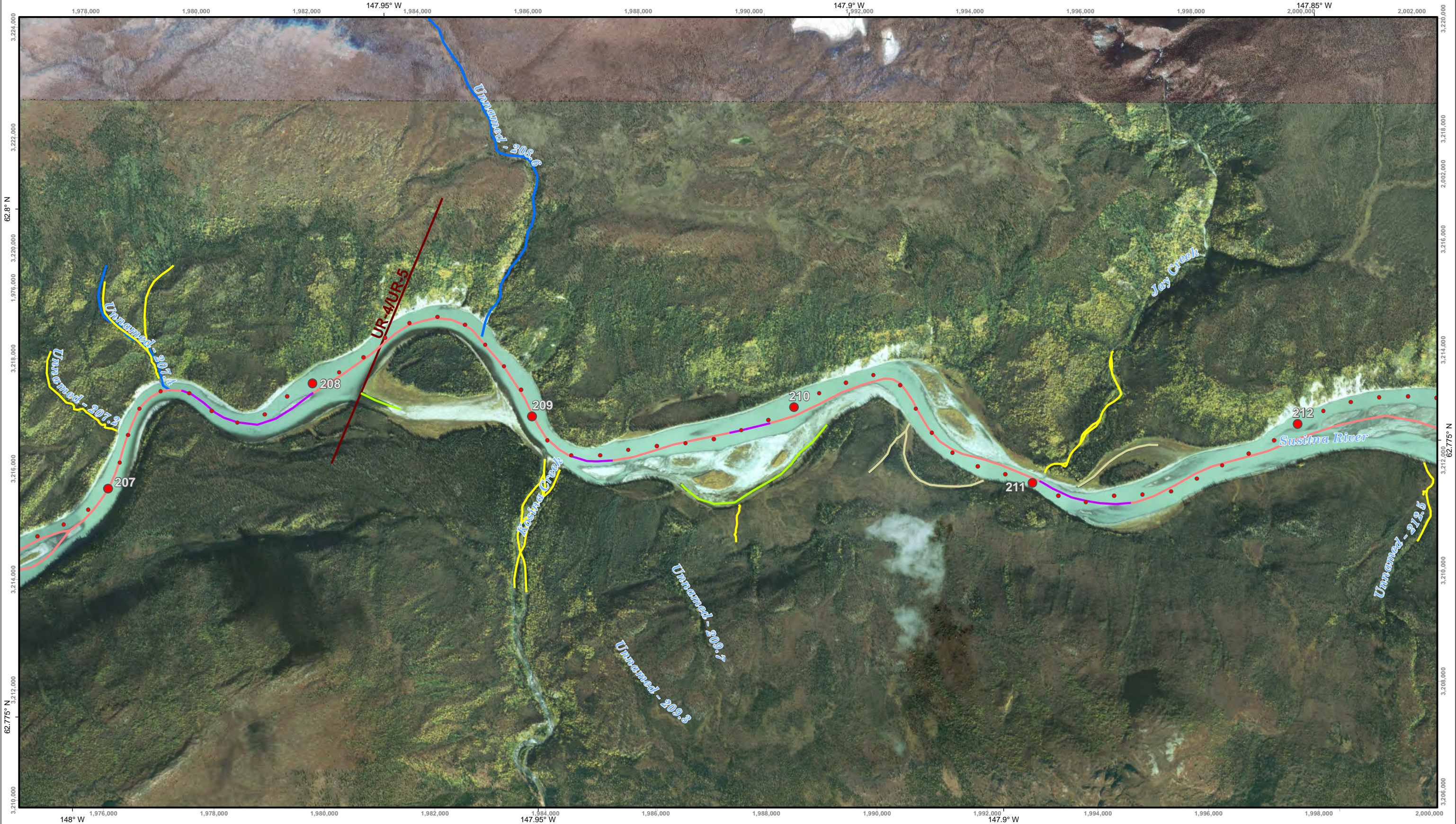
Map Projection: NAD83 State Plane Zone 4 (Feet)
 Grid Interval: 2000'

General Features			
●	Susitna Project River Miles	—	Glide or Run
—	Susitna Geomorphic Reach Breaks	—	Pool
	Focus Area	—	Rapid
		—	Riffle
		—	Side Slough
		—	Tributary
		—	Unidentified
		—	Upland Slough
		—	Backwater
		—	Beaver Complex



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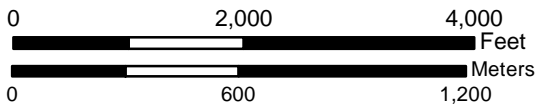
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Fish Barrier and Aquatic Habitat Field Survey Map Book

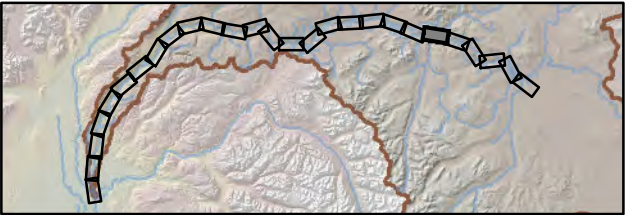


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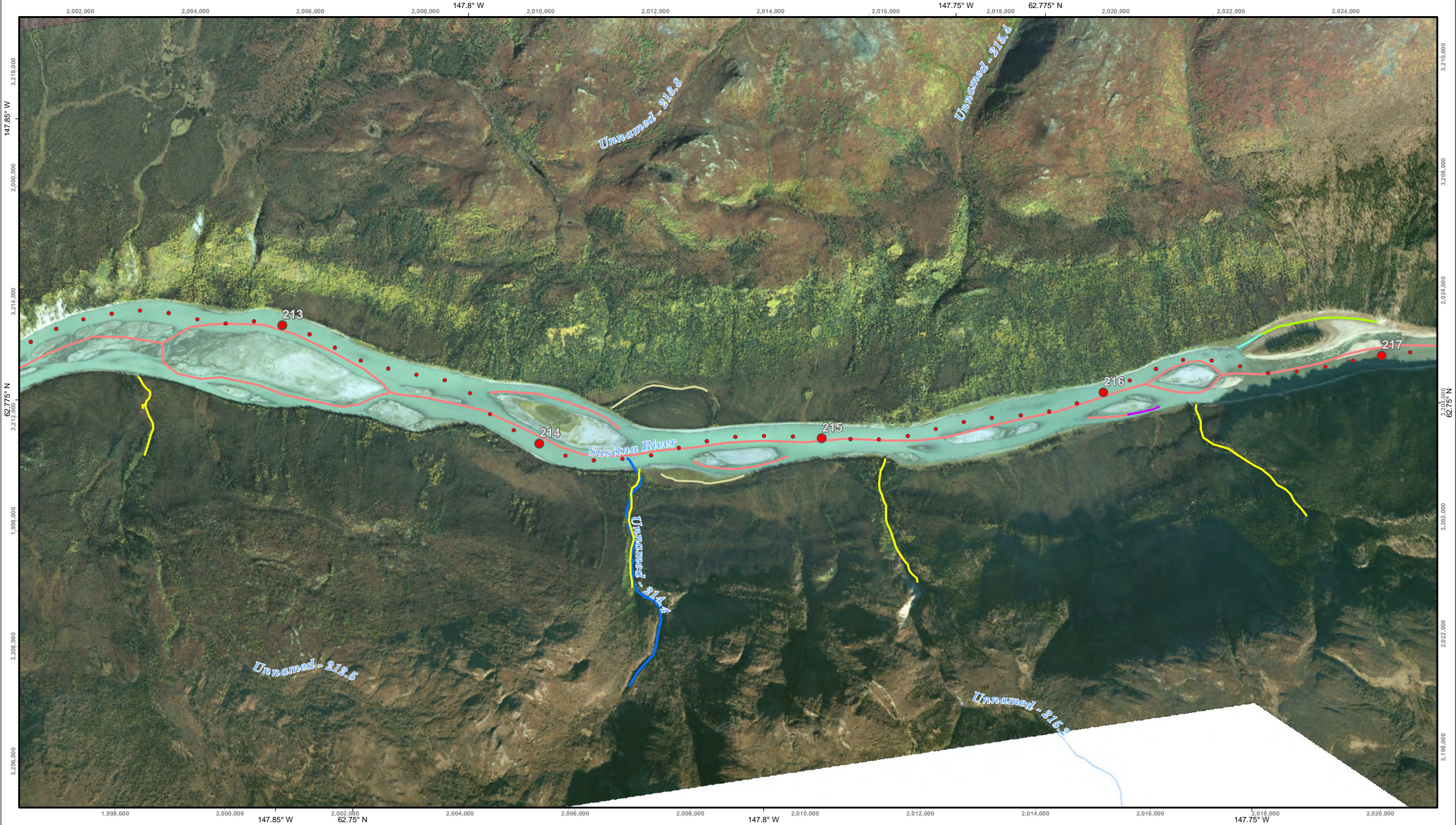


Map Projection: NAD83 State Plane Zone 4 (Feet)
Grid Interval: 2000'

General Features			
●	Susitna Project River Miles	—	Glide or Run
—	Susitna Geomorphic Reach Breaks	—	Pool
	Focus Area	—	Rapid
		—	Riffle
		—	Side Slough
		—	Tributary
		—	Unidentified
		—	Upland Slough
		—	Backwater
		—	Beaver Complex



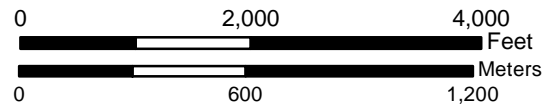
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General Features

- Susitna Project River Miles
- Susitna Geomorphic Reach Breaks
- Focus Area

Mesohabitats

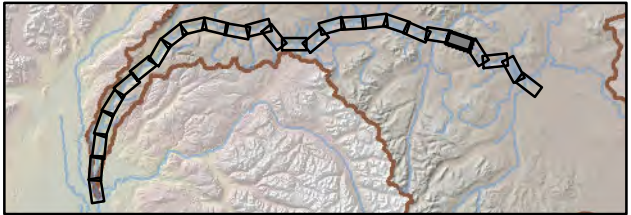
- Glide or Run
- Pool
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Macrohabitats

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Special Habitat Features

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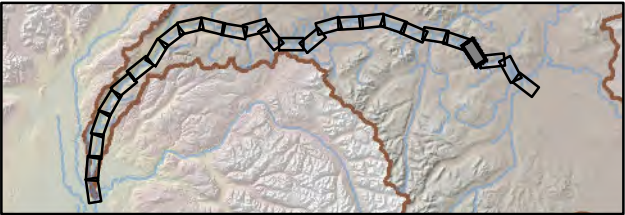
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0 2,000 4,000 Feet
0 600 1,200 Meters

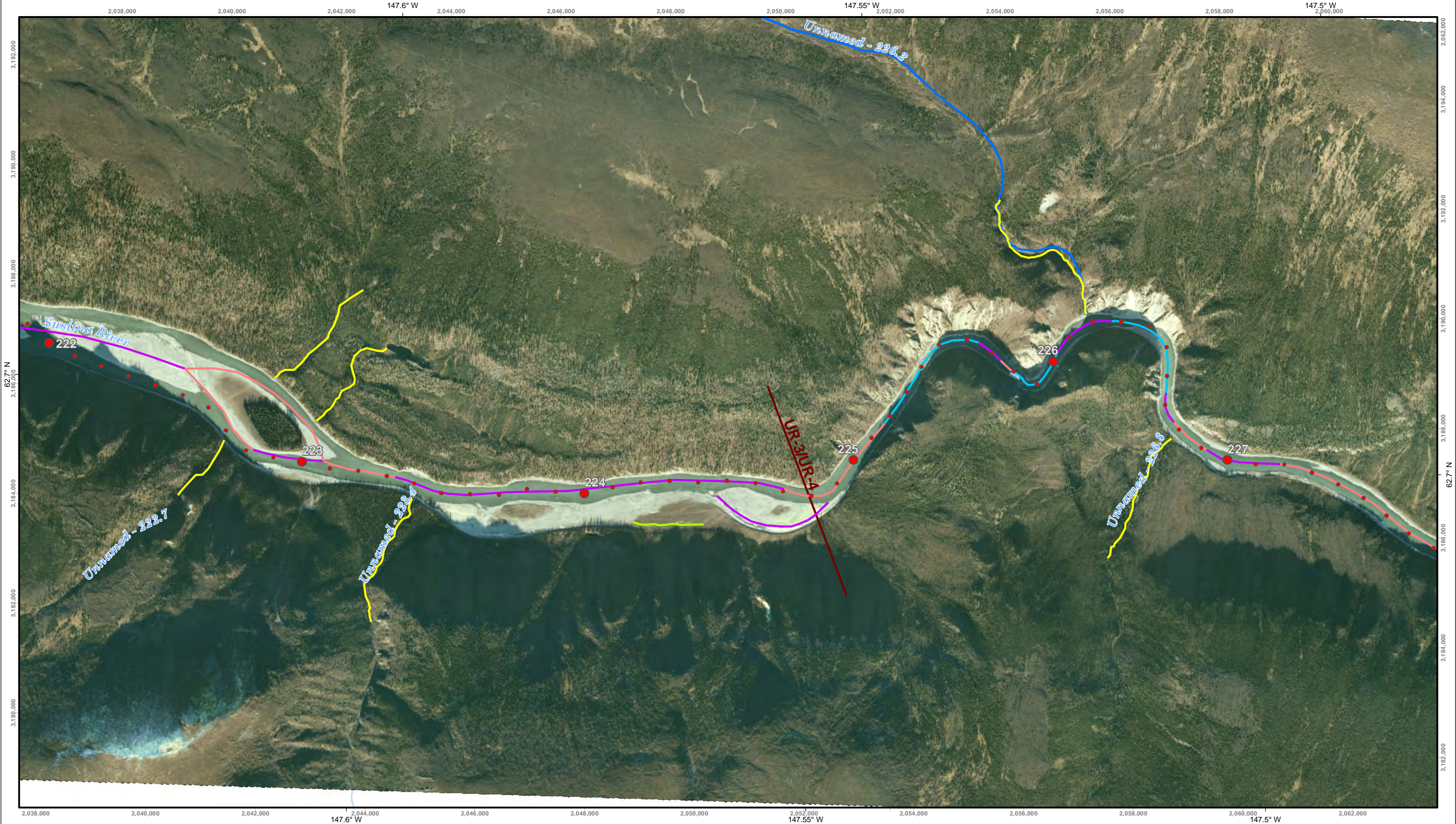
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ENERGY AUTHORITY

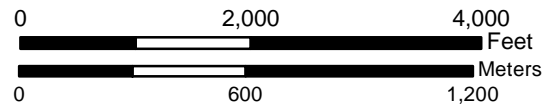
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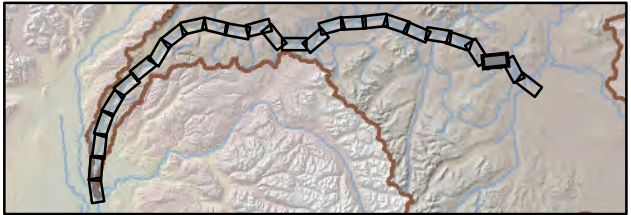
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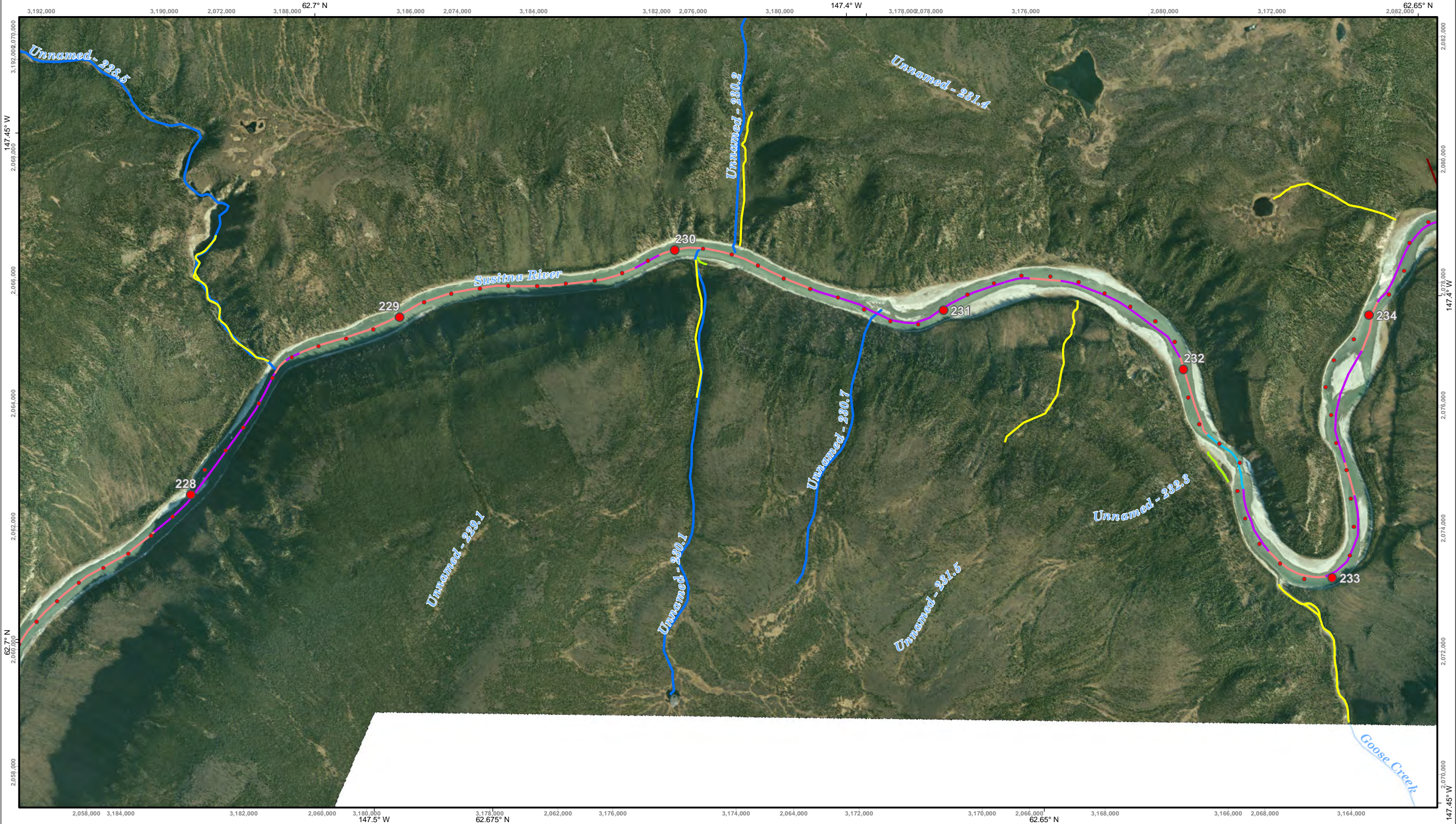
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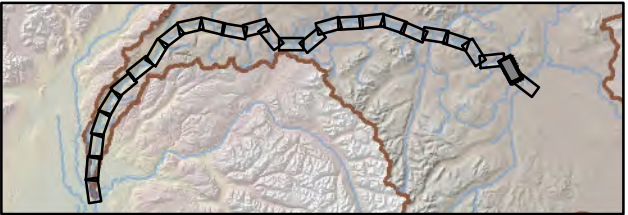
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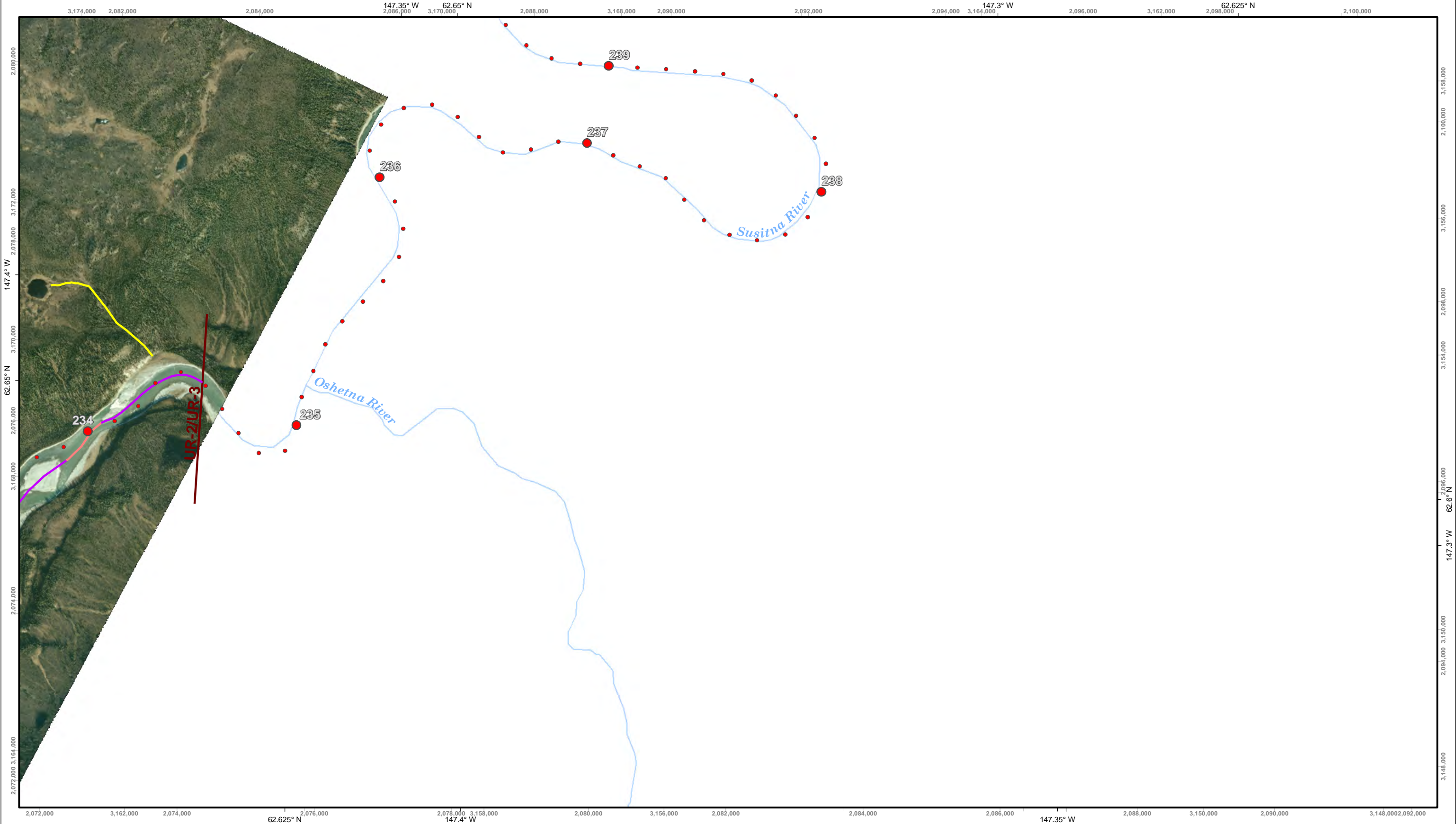
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ENERGY AUTHORITY

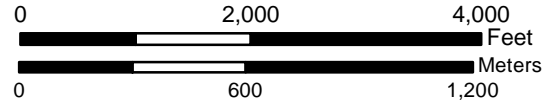
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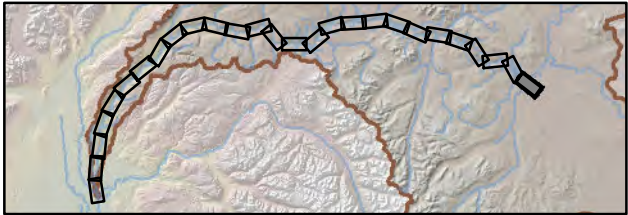
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