

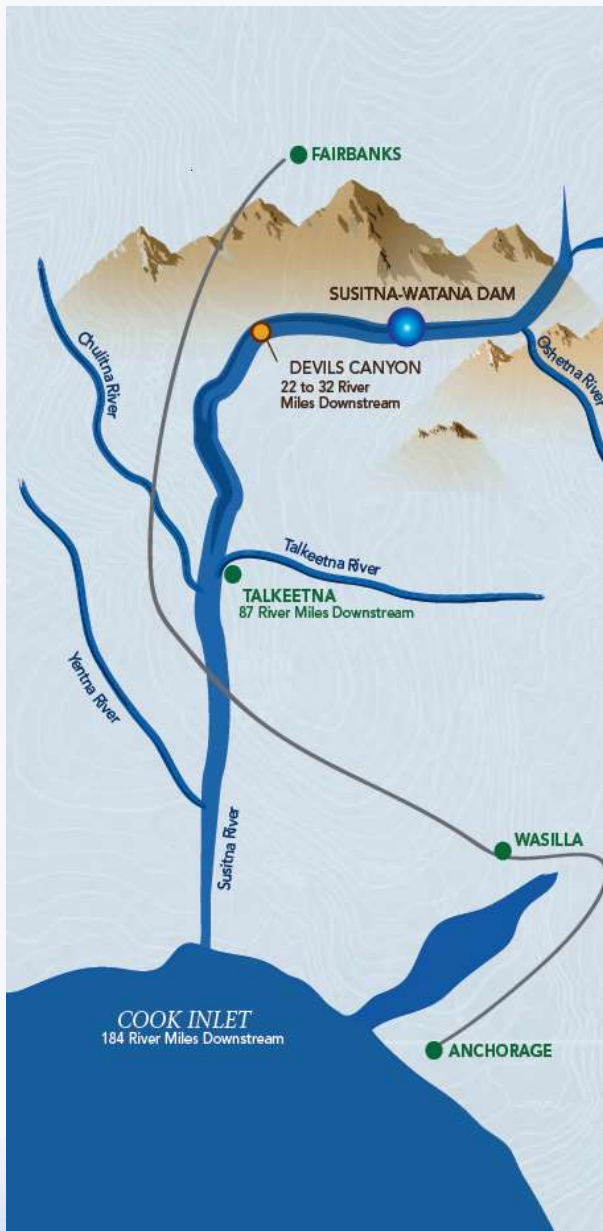
Initial Study Report Meeting

Study 11.6 Riparian Vegetation Study Downstream of the Proposed Susitna- Watana Dam

March 24, 2016

Prepared by

ABR, Inc.—Environmental
Research & Services



Study 11.6 Status

ISR Documents (ISR Part D, Section 4)

- **Initial Study Report Part A, B, and C (Jun 3, 2014)**
Summarizes the field survey data from 2012 and 2013, presents preliminary ITU mapping results and a preliminary riparian ecotype classification.
- **2014 – 2015 Study Implementation Report (Nov 4, 2015)**
Describes the sediment core and associated vegetation data collection conducted in September 2014, and the sediment aging analysis work conducted by staff at the University of Exeter.
 - **Appendix A – Riparian Vegetation Groundwater / Surface Water Study Sampling Design**
Describes additional sampling of rapid vegetation transects to be conducted at Middle and Lower River sites at which there are groundwater/surface water transects and groundwater wells.
- **ISR Part D (Nov 6, 2015)**
Study status described; also provides list of documents filed and tasks completed for the study as of early November 2015.

Study 11.6 Status

Status

- From 2013 through 2015, field surveys were completed as described in the RSP (Section 11.6.4.2) while implementing the three variances described in the ISR Part A, Section 4.2.
- Aging of the sediment cores collected in 2013 and 2014 is nearing completion.
- In September 2015, soil stratigraphy data were collected at those soil core sampling locations at which soil stratigraphy data were lacking.
- Senior-level QA/QC of the initial ITU mapping is underway. ITU map revision and final classification of riparian ecotypes, wildlife habitats, and wetlands remains to be completed.

Study 11.6 Objectives

- Classify, delineate, and map riparian ecotypes, wetlands, and wildlife habitats downstream from the Watana Dam site;
- Characterize the role of erosion and sediment deposition in the formation of floodplain surfaces, soils, and vegetation;
- Quantify and describe Susitna River riparian vegetation communities; and
- Coordinate closely in the implementation of the Riparian IFS (Study 8.6), Groundwater Study (Study 7.5), Ice Processes in the Susitna River Study (Study 7.6), and Fluvial Geomorphology Modeling below Watana Dam Study (Study 6.6)

Study 11.6 Components

- Develop mapping materials from historical and current data (ISR Part A, Section 4.1; 4); data sources include:
 - Vegetation mapping and succession studies conducted in the 1980s
 - National Wetland Inventory (NWI) mapping
 - Hydrographic and digital elevation data
 - Recent high- and moderate-resolution aerial imagery
- Field Surveys (ISR Part A, Section 4.2; 5)
- Integrated Terrain Unit (ITU) classification and mapping of downstream riparian areas (ISR Part A, Section 4.3; 12)— ITU components include geomorphology, surface form, vegetation class, poplar size class, and disturbance class

Study 11.6 Variances

(ISR Part D, Section 6)

- As described in ISR Part A, Section 4.2, the original plot-allocation procedure to determine the number of ELS plots in Focus Areas (FAs) was based on FA size alone (RSP 11.6.4.2).
 - In response to agency comments, this was revised to account for both FA size and the number of riparian ecotypes in each FA, such that a smaller-sized FA with a higher number of ecotypes would be assigned a larger number plots than it would based on size alone.
 - Overall a higher number of ELS plots were allocated within each FA than under the original procedure.
 - A technical memorandum describing this revised plot-allocation procedure was filed with FERC on July 1, 2013.

Study 11.6 Variances

(ISR Part D, Section 6)

- As described in ISR Part A, Section 4.2, on ELS plots the spacing interval for the point-intercept vegetation sampling locations along transect lines was increased from 0.5 m (as originally described in the FERC-approved study plan) to 1 m.
 - This change facilitated the collection of more representative and accurate plant cover data (i.e., less overlap in recording the same plants in the dense, multi-canopied vegetation in the Susitna River floodplain).
 - The larger sampling interval required a larger sampling radius (23 m) for the ELS plots.

Study 11.6 Variances

(ISR Part D, Section 6)

- As described in ISR Part A, Section 4.2, for ELS plots along groundwater transects, the groundwater installation equipment was placed just outside the 23-m radius of each ELS plot (as opposed to the plot center noted in the FERC-approved study plan).
 - This was done to reduce the risk of vegetation disturbance within the plot because the groundwater installation equipment was large relative to the 3-m-radius ELS plot center.
 - Avoiding vegetation disturbance in intensive plots is important because these are designed as long-term monitoring plots.

Summary of Results

(ISR Part A, Section 5)

- **2012 field surveys completed during one sampling period (June 24-July 3):**
 - June 24–July 3: 87 ITU plots along 28 transects were sampled
 - the ITU transects span a number of floodplain features and the sample plots were placed in distinct vegetation types
 - vegetation and soils data were collected at the ITU plots
 - ITU plots designed primarily to support the mapping of riparian vegetation

Summary of Results

(ISR Part A, Section 5)

2013 field surveys completed as planned in four survey periods (April 30–May 3, May 19–22, June 17–July 10, July 24 –August 12):

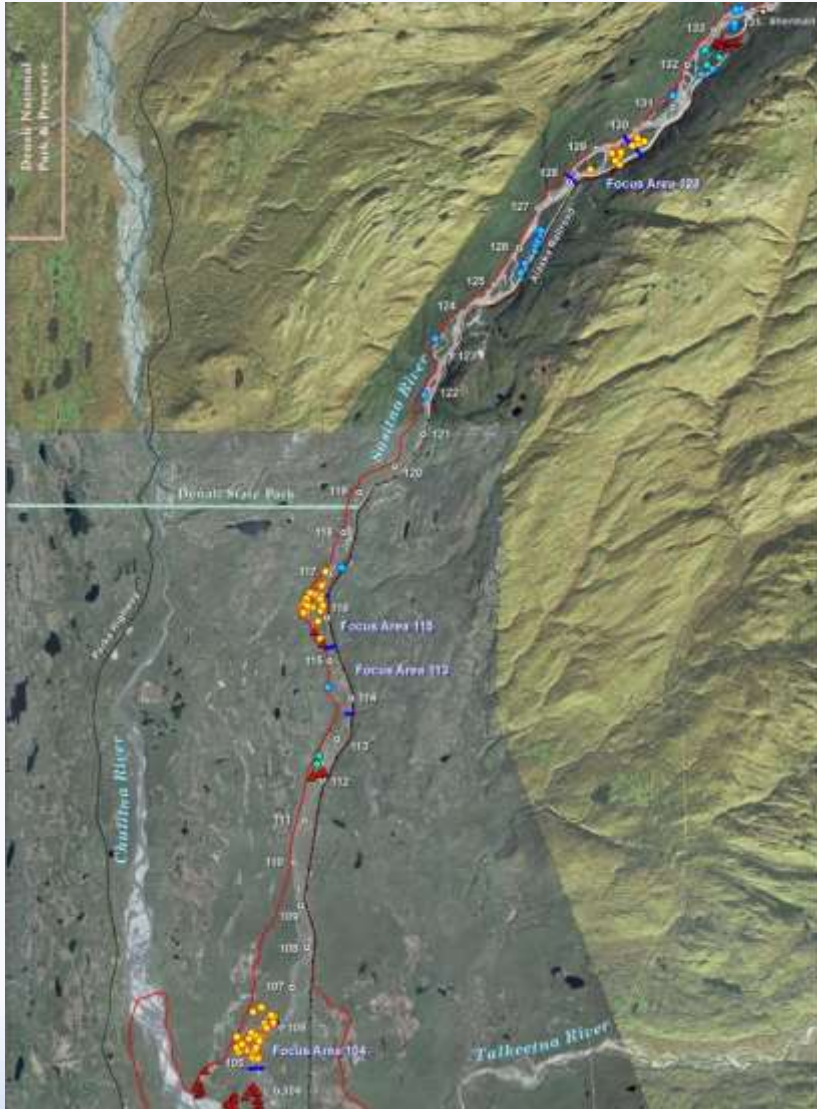
- April–May: AVC Level III and surficial geomorphology verification
- May: soil trenching and soil core sampling trials
- June–August: sampling of 214 ITU plots along 35 transects
 - the ITU transects span a number of floodplain features and the sample plots were placed in distinct vegetation types
 - vegetation and soils data were collected at the ITU plots, primarily to support the mapping of riparian vegetation

Summary of Results

(ISR Part A, Section 5)

- June–August 2013: 62 intensive, permanent ELS plots were established and sampled
 - vegetation composition and soils data
 - dendrochronology and forest structure data were collected
 - ELS plots are designed to serve as long-term monitoring plots

Summary of Results (ISR Part A, Section 5)



- ELS and ITU Plots (2013) and Planned ELS Plots (TBD), Middle River



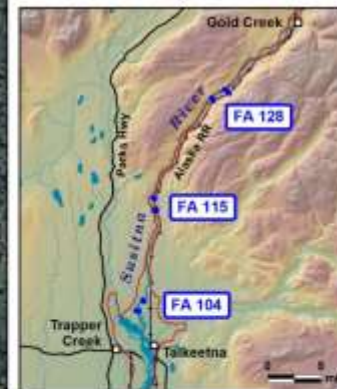
Summary of Results (ISR Part A, Section 5)



Legend

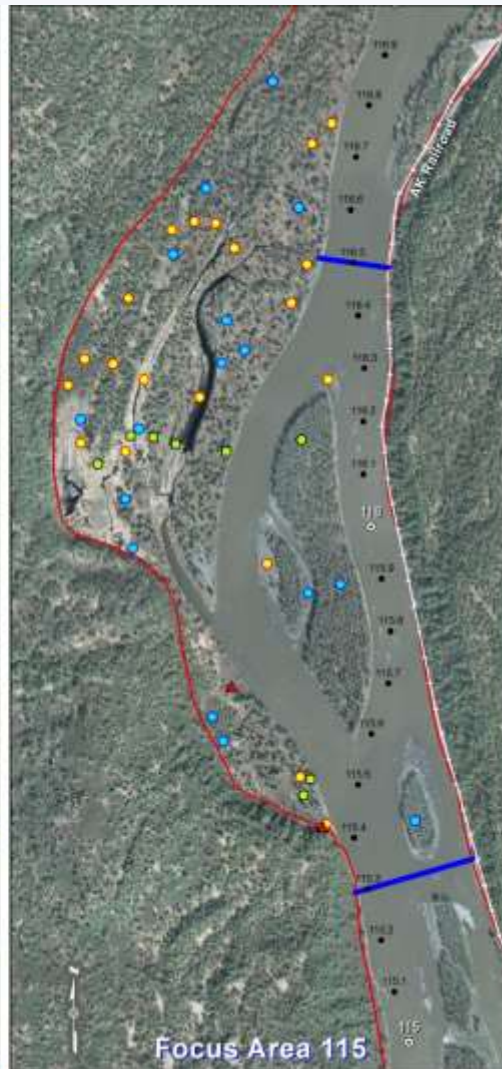
- 2013 ELS Plot
- 2013 ELS Plot, Sediment Core
- 2013 Sediment Core
- + 2013 Sediment Core
- + 2013 Soil Trench
- ▲ 2013 ITU Mapping Plot
- Planned 2014 ELS Plot
- Instream Flow Focus Area (Upper and Lower Extent)
- 2013 Riparian Study Area
- Project River Mile
- Project River 0.1 Mile

Data Sources: See Map References
AEA Project Land Status from
SuWaOwnership - 20130910 HDR

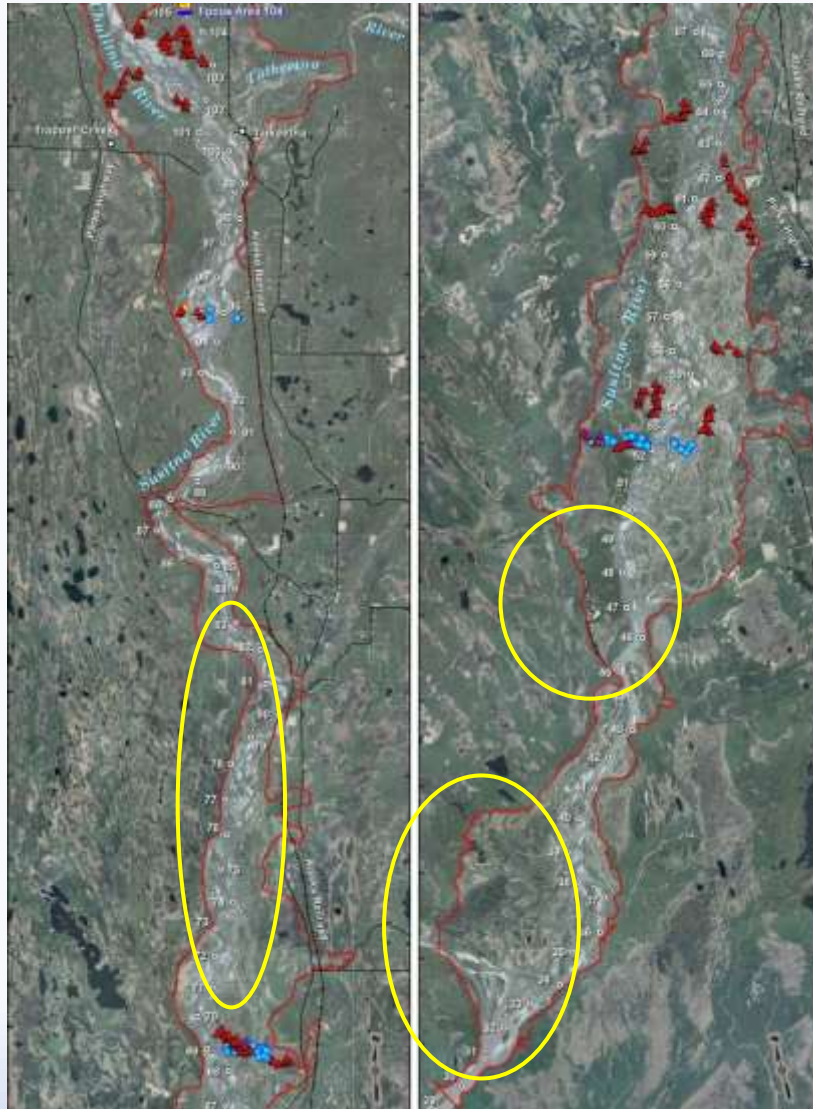


0 500 1,000 1,500
Feet
0 100 200 300 400 500
Meters

Projection: AK State Plane Zone 4 NAD 1983
Date Saved: 10/10/2013
Map Author: ABR, Inc. - Allison Zhai Cobb
File: SuWa_ABR_RPR_FA_Plots_ISR_2013_v01.mxd



Summary of Results (ISR Part A, Section 5)



- ELS and ITU Plots (2013) and Planned ELS Plots (TBD), Lower River

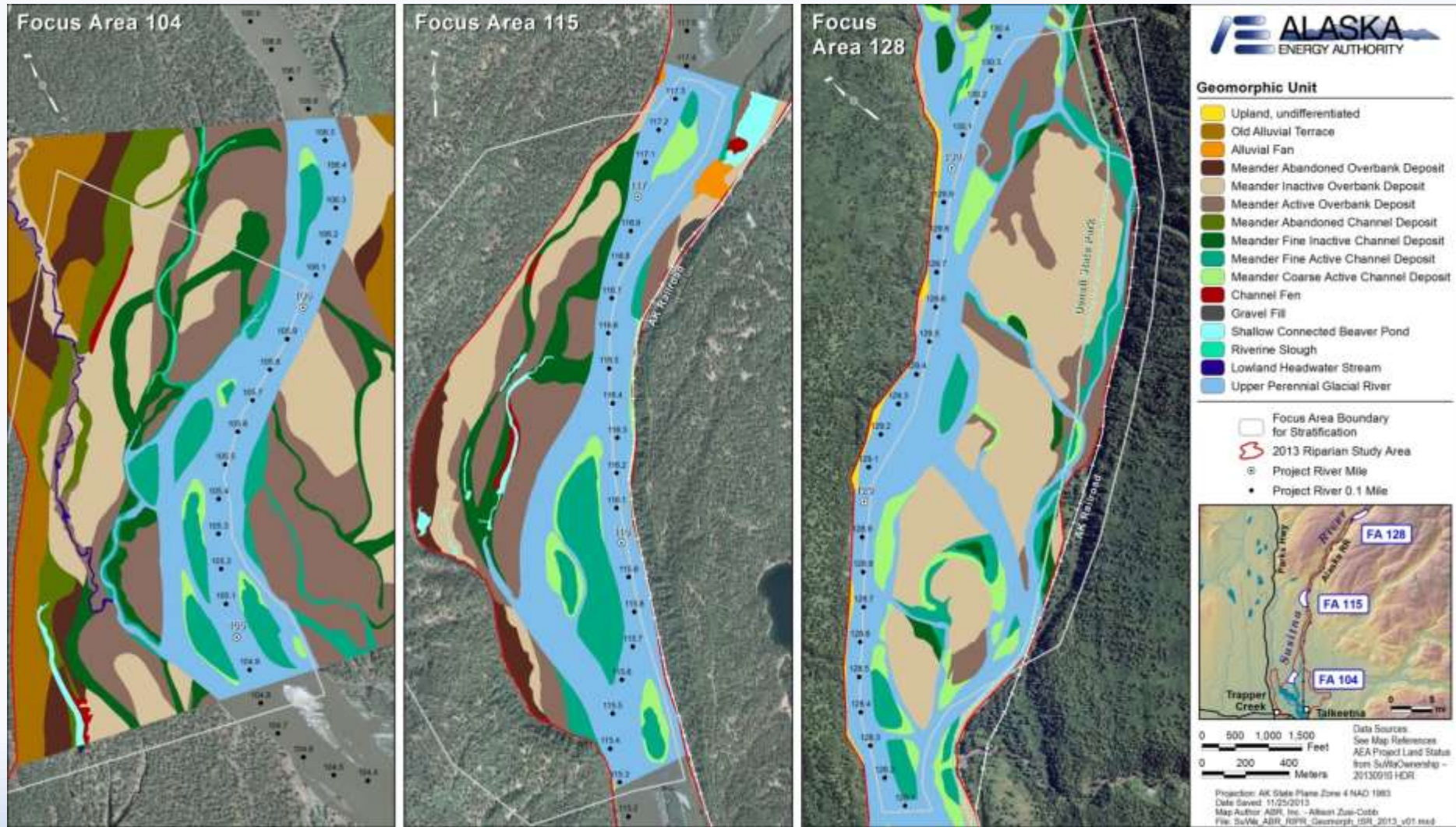


Summary of Results

- Draft riparian mapping (~130K acres) complete and mapping quality assurance and control review in progress
- Twenty-five soil stratigraphy cores sampled in riparian areas of the Susitna River between PRM 105 and 146 in September 2014.
- Preliminary ecotype analysis of 2013 field data.
- ITU attributes recorded for each map polygon include:
 - AVC Level IV vegetation class
 - Seral vegetation class (e.g., poplar size class)
 - Riverine geomorphology class, indirectly gets at flood frequency

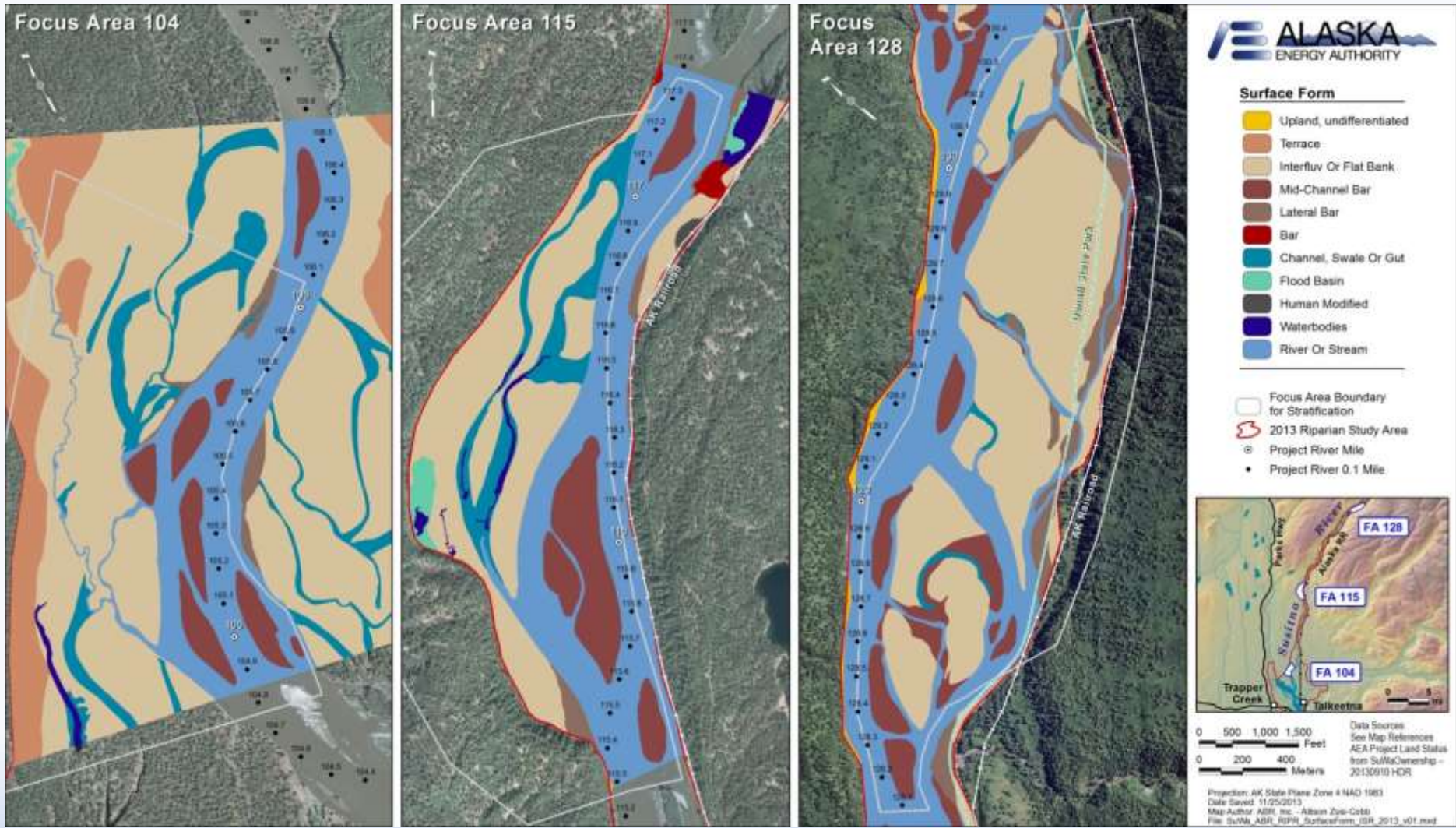
Summary of Results - Geomorphology in Focus Areas

(ISR Part A, Section 5)



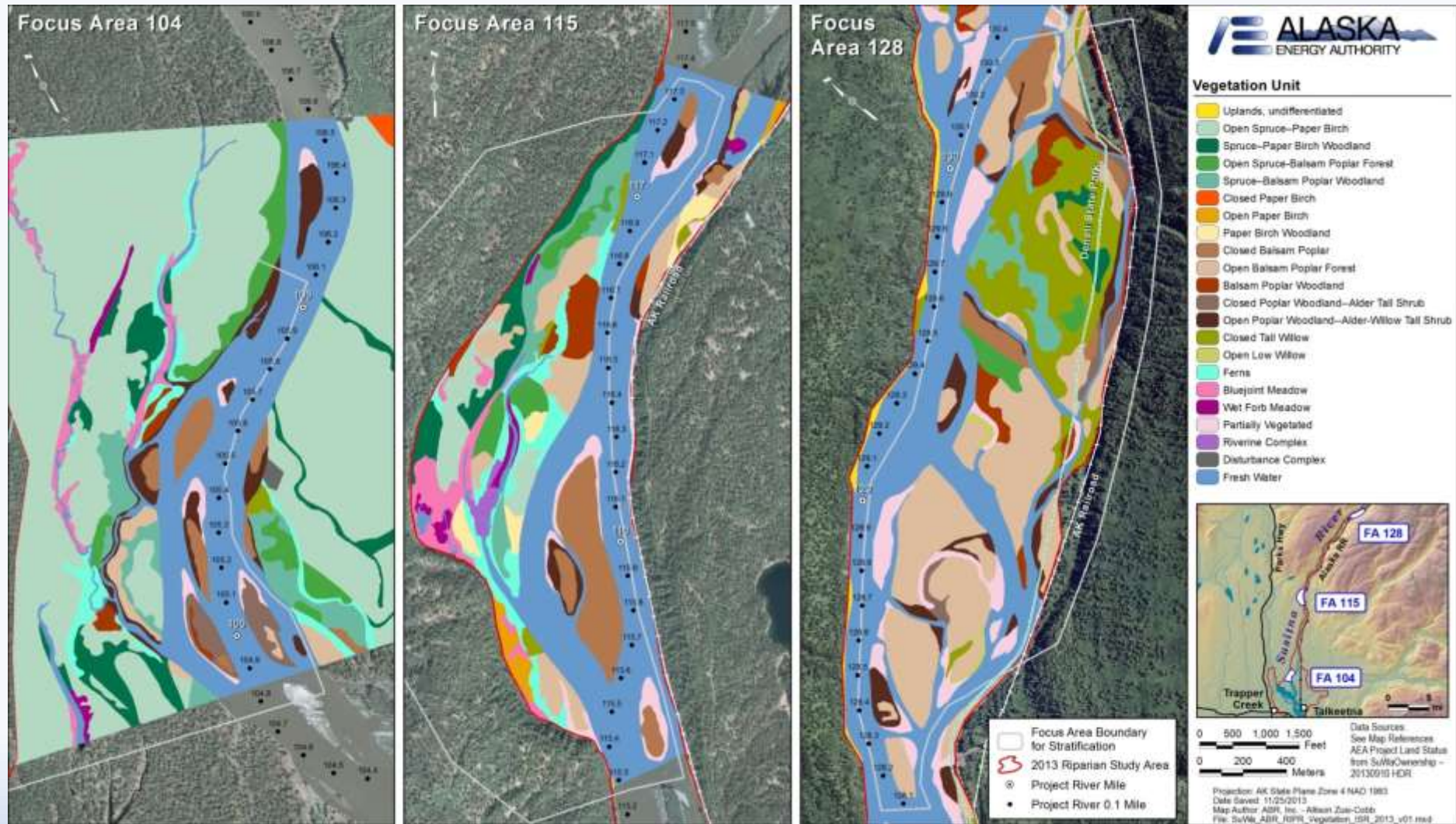
Summary of Results - Surface Forms in Focus Areas

(ISR Part A, Section 5)



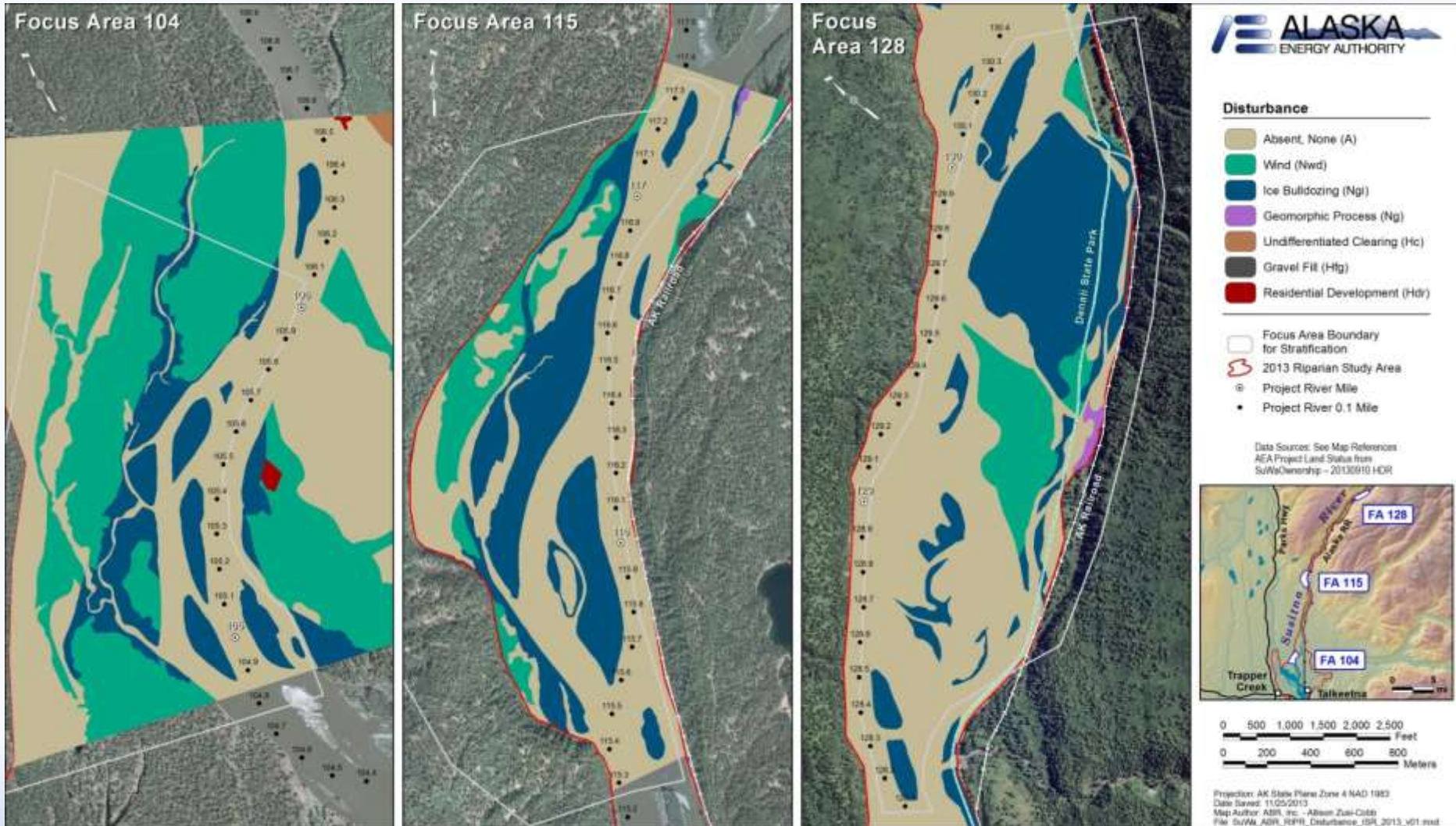
Summary of Results - Vegetation in Focus Areas

(ISR Part A, Section 5)



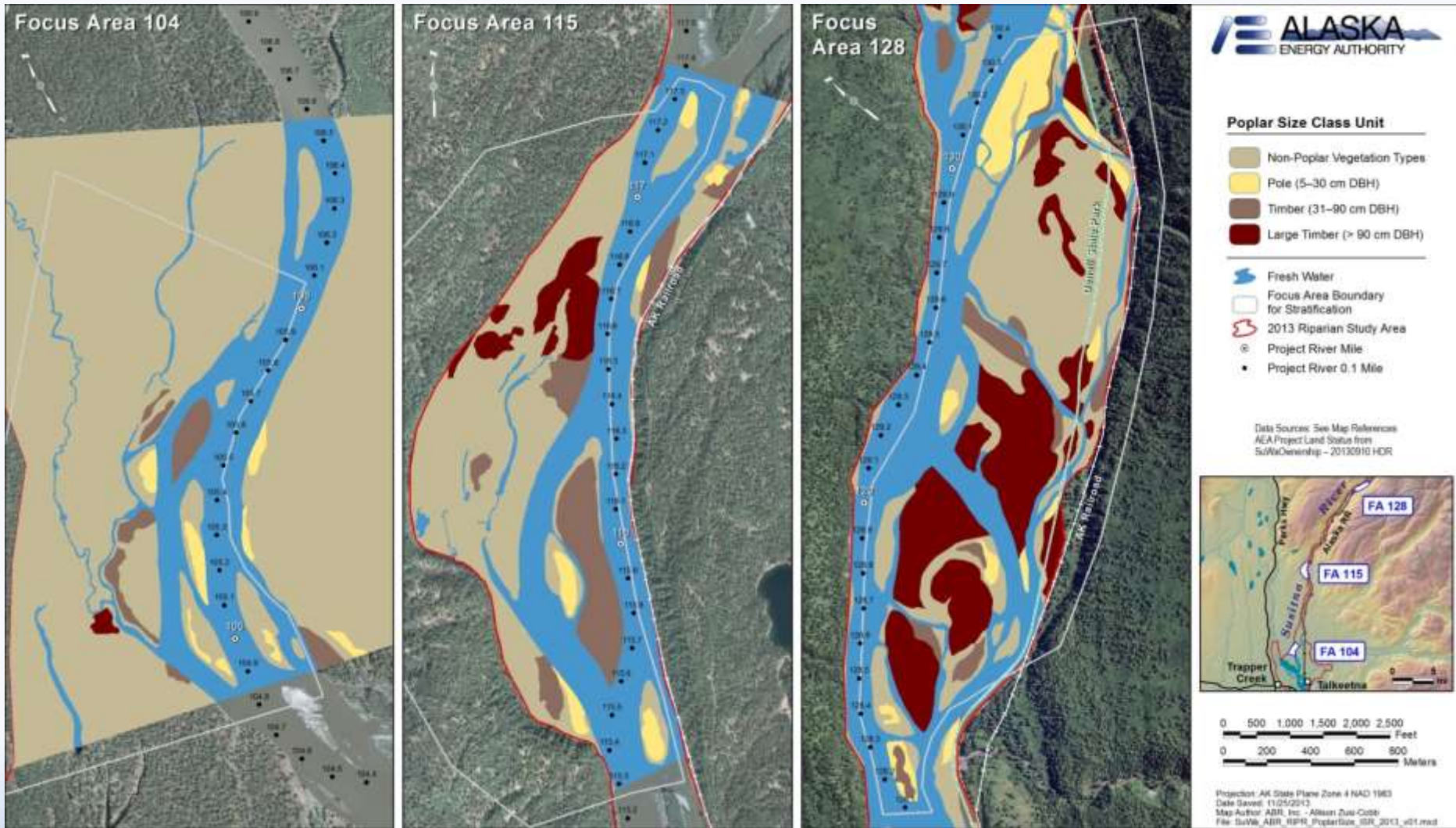
Summary of Results - Disturbance Classes in Focus Areas

(ISR Part A, Section 5)



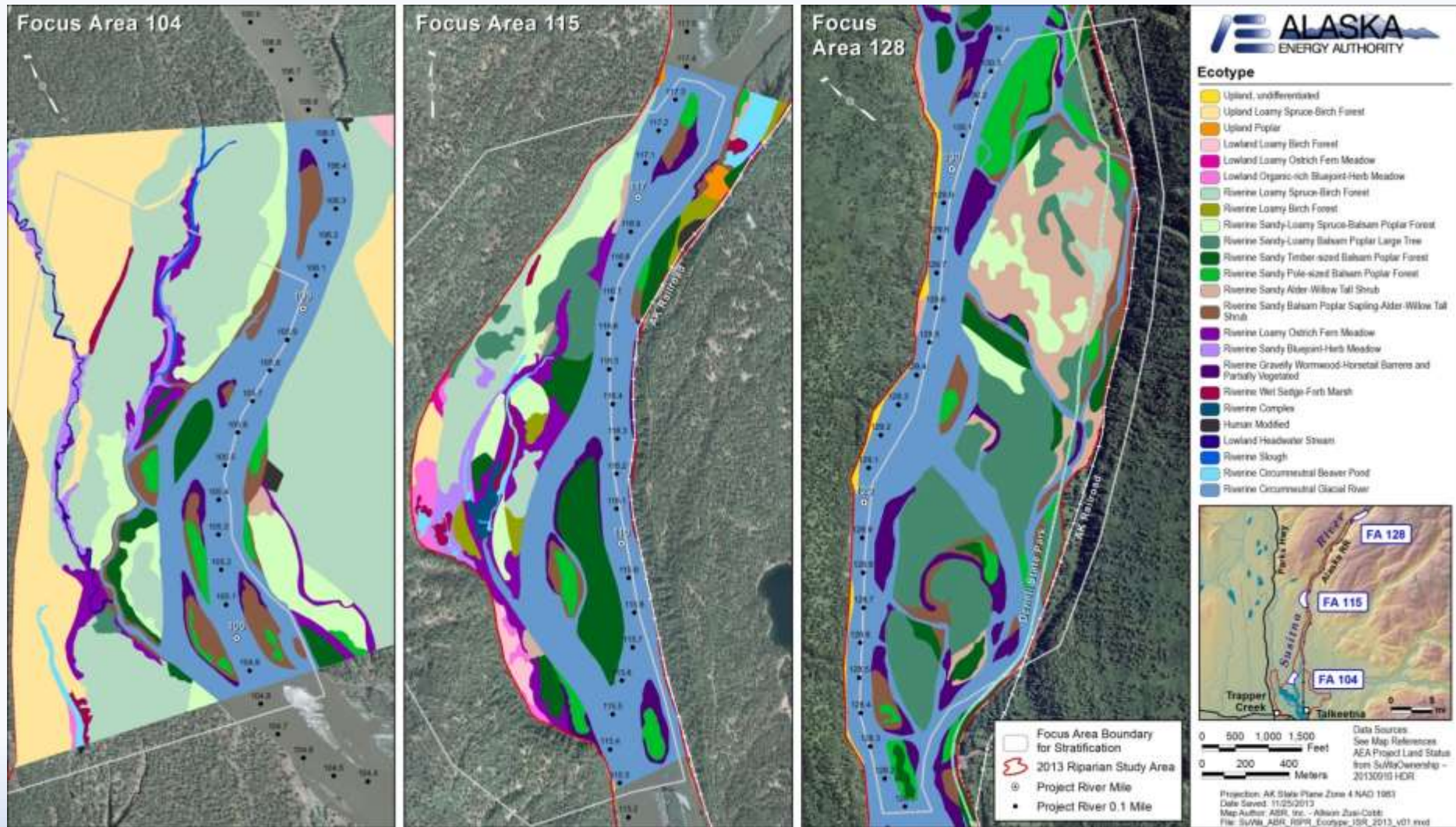
Summary of Results - Poplar Size Classes in Focus Areas

(ISR Part A, Section 5)



Summary of Results - Ecotype Mapping in Focus Areas

(ISR Part A, Section 5)



Summary of Results - 2014 Sediment Core Sampling Locations (SIR Section 4.2)



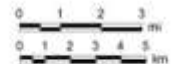
- 25 sediment cores were collected at sites where the vegetation also was sampled (7 ELS plots, previously sampled, and 18 ITU mapping plots)

Legend

- 2014 Sediment Core
- Instream Flow Focus Area (Upper and Lower Extent)
- ① 2014 Riparian Study Area
- ⊙ Project River Mile



Data Sources: AEA Project Land Status from Su/Wa Ownership - 2014/02 HDR



Projection: AK State Plane Zone 4 NAD 1983
Date Saved: 6/26/2015
Map Author: ADR, Inc. - Allison Zusi-Cobb
File: Su/Wa_ADR_RIPRI_MRR_SedCores_TyEnd_v01.mxd

AEA's Proposed Modifications

(SIR Section 7.1)

- As described in ISR Part A, Section 4.2.5.1, for ELS plots the spacing interval for the point-intercept vegetation sampling locations along transect lines was increased from 0.5 m (as originally described in the FERC-approved study plan) to 1 m.

AEA's Proposed Modifications

(SIR Section 7.2 and Appendix A)

In response to agency comments during the October 17, 2014 ISR meeting a revised study design for the co-located sampling of groundwater/surface water and riparian vegetation was prepared.

The revised design calls for the additional sampling of rapid vegetation transects (RVTs) to be established in four FAs in the Middle River and along four riparian transects in the Lower River at which there are groundwater/surface water (GW/SW) transects and groundwater wells.

Steps to Complete the Study

(ISR Part D, Section 8)

- Sample plot locations will be determined and field ground-reference surveys will be conducted in portions of the study area not yet sampled;
- Additional vegetation sampling using rapid field methods will be conducted along selected riparian GW/SW transects in the Middle and Lower River;
- The draft ITU mapping in the study area will be reviewed for consistency with the field data from all study years and revised as necessary to prepare a final ITU map layer;
- Field data from all study years will be combined and analyzed to update the current ecotype classification;
- Wildlife habitat and wetland types will be derived from the ITU map data in coordination with Studies 11.5 and 11.7;
- A spatial join in GIS to match and merge the polygon boundaries mapped in this study with those in the adjacent study areas for Studies 11.5 and 11.7 will be completed;

Steps to Complete the Study

(ISR Part D, Section 8)

- Laboratory geochronology analyses to age sediment layers in the core samples collected in the study area will be completed by staff at the University of Exeter;
- Natural riparian vegetation successional models will be prepared for use in the modeling of post-development changes in riparian vegetation; and
- The study team will provide data to and collaborate with researchers for the Riparian IFS (Study 8.6) in the modeling of post-development changes in riparian vegetation.

Licensing Participants Proposed Modifications to Study 11.6?

- Agencies
- CIRWG members and Ahtna
- Public