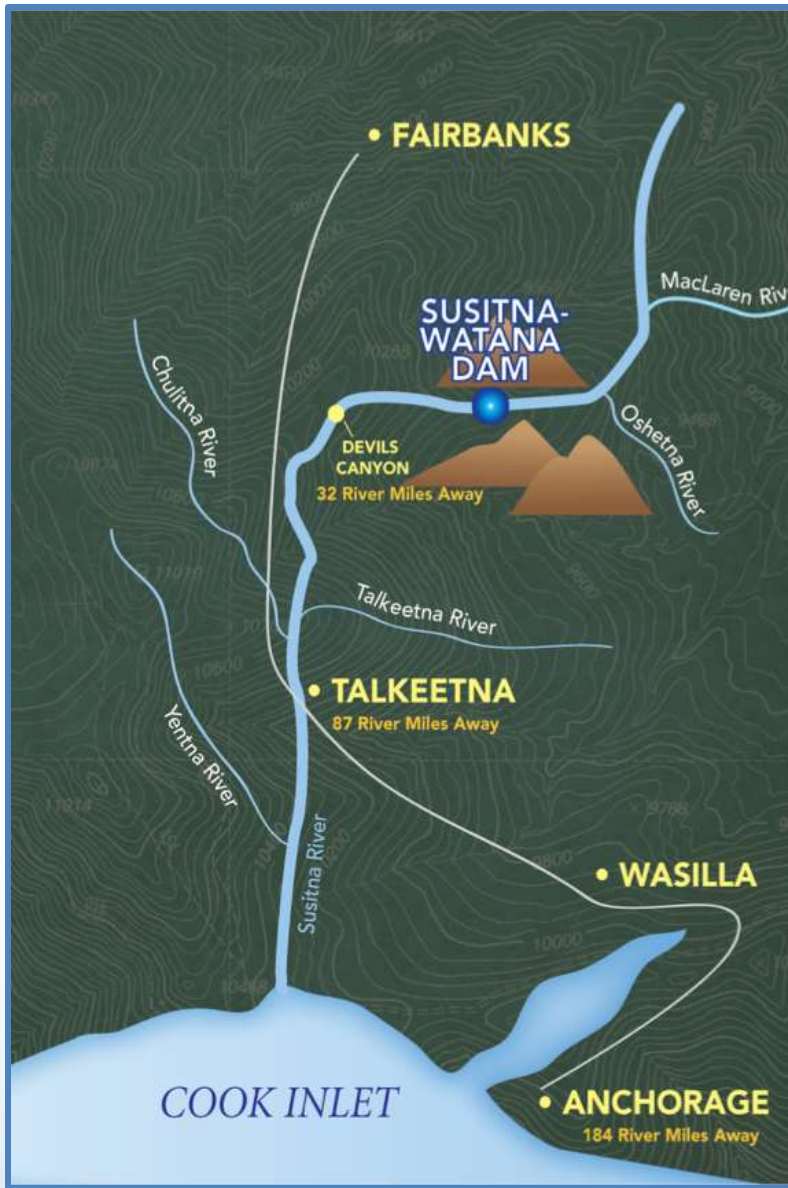


Technical WorkGroup Meeting Q3 2013 TWG

Botanical Program Updates

10 September 2013

Prepared by ABR, Inc.



Botanical Studies – Presentation Overview

- *Q3 2013 updates on the status of the five Project botanical studies:*
 - *FSP 11.5: Vegetation and wildlife habitat mapping*
 - *FSP 11.6: Riparian vegetation study (downstream of the proposed dam site)*
 - *FSP 11.7: Wetland mapping study*
 - *FSP 11.8: Rare plant study*
 - *FSP 11.9: Invasive plant study*



Aerial Imagery Update

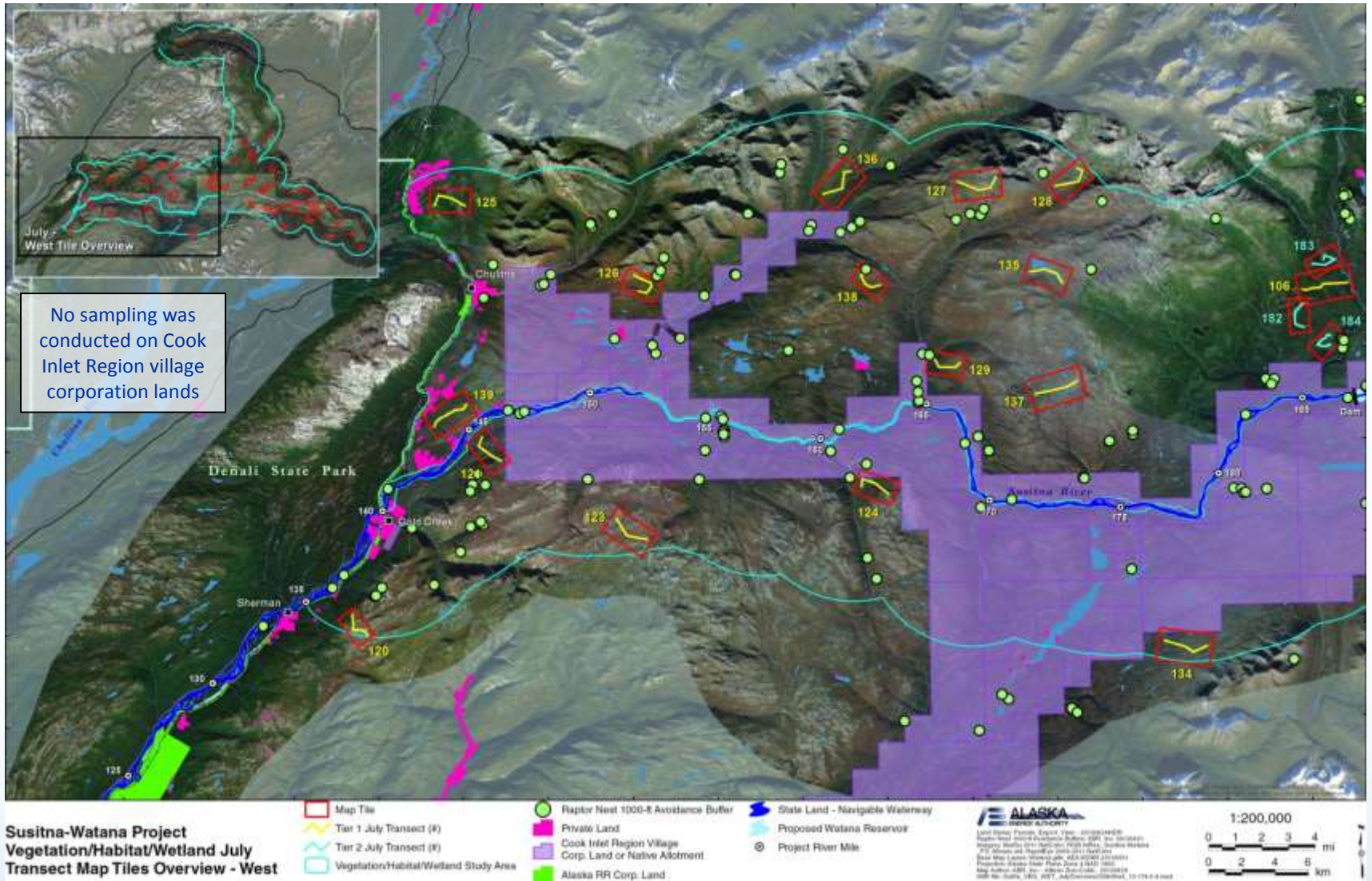
- *Aerometric successfully acquired digital aerial photography in July 2013 for the remaining portions of the vegetation/wildlife habitat (FSP 11.5) and wetland mapping (FSP 11.7) study areas – due to be processed and delivered in early October*
- *With this acquisition, current and high-resolution imagery will be available for all portions of the mapping study areas for all botanical studies*
- *Important because this mapping will support impact assessments for vegetation and wetlands, and habitat-loss assessments for wildlife (in the License Application)*



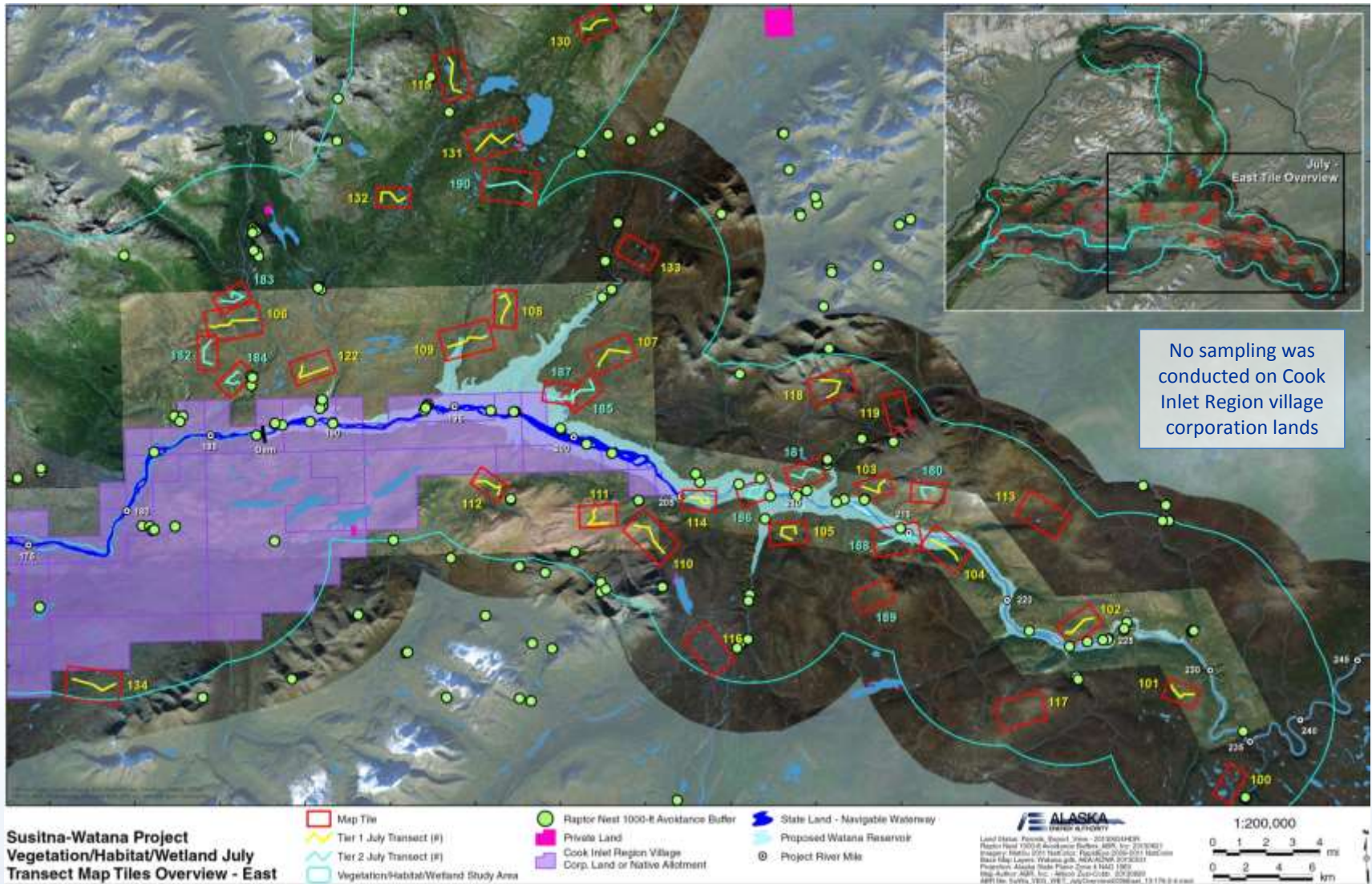
11.5 and 11.7 Vegetation/Habitat and Wetland Mapping – Field Update

- *Field ground-truth surveys were completed as planned in two field efforts (early July and late July/early August):*
 - *77 transects, with a variable number of full study plots and verification plots on each, were surveyed*
 - *612 full study plots were sampled; data collected on these plots included vegetation cover, wetland soils information, landscape variables, wetland functional assessment data, and wildlife use information; formal wetland determinations were conducted at each of these plots*
 - *290 rapid verification plots, on which primarily vegetation data for dominant species were recorded, also were sampled; verification plots are used to provide additional field documentation of aerial image signatures*

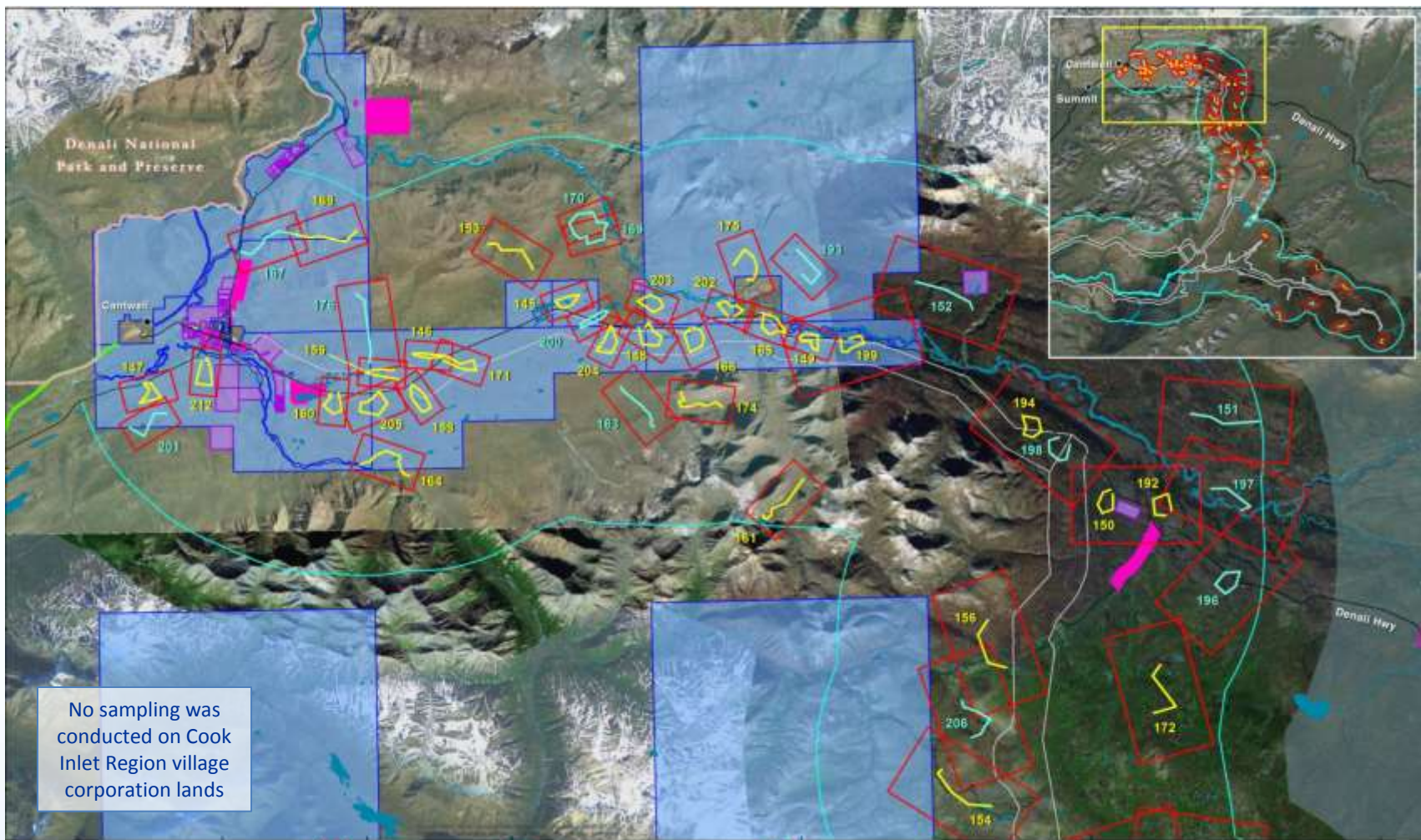




No sampling was conducted on Cook Inlet Region village corporation lands



No sampling was conducted on Cook Inlet Region village corporation lands



No sampling was conducted on Cook Inlet Region village corporation lands

**Susitna-Watana Project
Vegetation/Habitat/Wetland
August Transects – North
Map Tiles Overview**

- August Map Tile
- Vegetation/Habitat/Wetland Study Area
- Private Land
- Cook Inlet Region Village Corp. Land or Native Allotment
- Ahtna, Incorporated
- Alaska RR Corp. Land
- Proposed Project Area
- Tier 1 August Transect (#)
- Tier 2 August Transect (#)

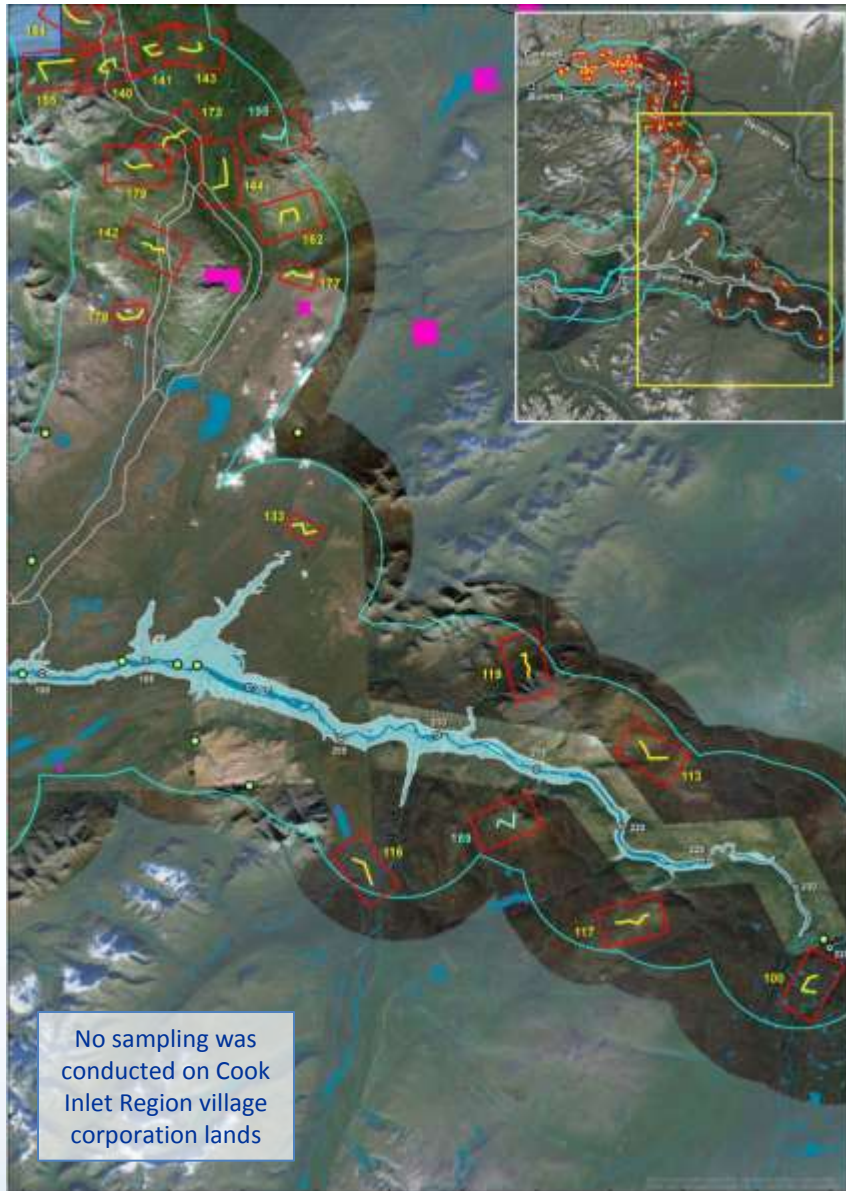
ALASKA ENERGY SERVICES
 Land Status Review, August 2013
 Report based on the 2012-2013 data. All data is preliminary.
 The map shows the project area, including the Denali Highway.
 Prepared by: Alaska Energy Services, Inc.
 Date: August 2013, by: Alaska Energy Services, Inc.
 2013 by: Alaska Energy Services, Inc.

1:120,000

0 1 2 3 4 5
mi

0 1 2 3 4 5
km

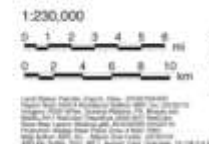
Vegetation/Habitat and Wetland Studies: August 2013 South and East Transect Locations



No sampling was conducted on Cook Inlet Region village corporation lands



Susitna-Watana Project Vegetation/Habitat/Wetland August Transects East and Reservoir Map Tiles Overview



11.5 and 11.7 Vegetation/Habitat and Wetland Mapping – Mapping Update

- *77,890 acres in the study area have been mapped to date*
- *Mapping efforts have been minimal during the summer field season, but will pick up again in the fall*
- *Attributes recorded for each map polygon include:*
 - *NWI and HGM wetland classes*
 - *Physiography and surface form categories*
 - *AVC Level IV vegetation classes*
 - *Disturbance classes, when applicable*
- *Multivariate wildlife habitat and wetland classes will be derived from these individual attributes*



11.5 and 11.7 Vegetation/Habitat and Wetland Mapping – Variances

- *The only variance from the study plans for these studies was the lack of field ground-truth surveys on Cook Inlet Region village corporation lands (access to those lands was not authorized in 2013)*



11.5 and 11.7 Vegetation/Habitat and Wetland Mapping – Next Steps

- *Field data QA/QC is ongoing*
- *Mapping is ongoing and will continue in earnest with additional mappers helping out this fall and winter*
- *A summary of the 2012 and 2013 field data and current mapping results will be presented in the Initial Study Report, to be filed with FERC on 3 February 2014*



11.6 Riparian Vegetation Study – FERC Study Plan Determination Recommendations

- *The following FERC concerns were resolved in collaboration with the riparian instream flow and riparian groundwater/surface water study teams during two meetings with TWG participants held in April and June:*
 - *Refine sampling design for the Focus Areas, including the stratification approach and justification for the number of Ecological Land Survey (ELS) plots sampled in and outside of Focus Areas*
 - *Outside of Focus Areas, determine ratio of the sample-intensive ELS plots to the less sample-intensive Integrated Terrain Unit (ITU) mapping plots*
 - *Include rare riparian habitats (e.g., herbaceous types) in the sampling scheme to ensure adequate coverage of all riparian habitats*
- **A technical memorandum describing these adjustments was filed with FERC on 1 July 2013, and the study plan has been updated to reflect these adjustments**

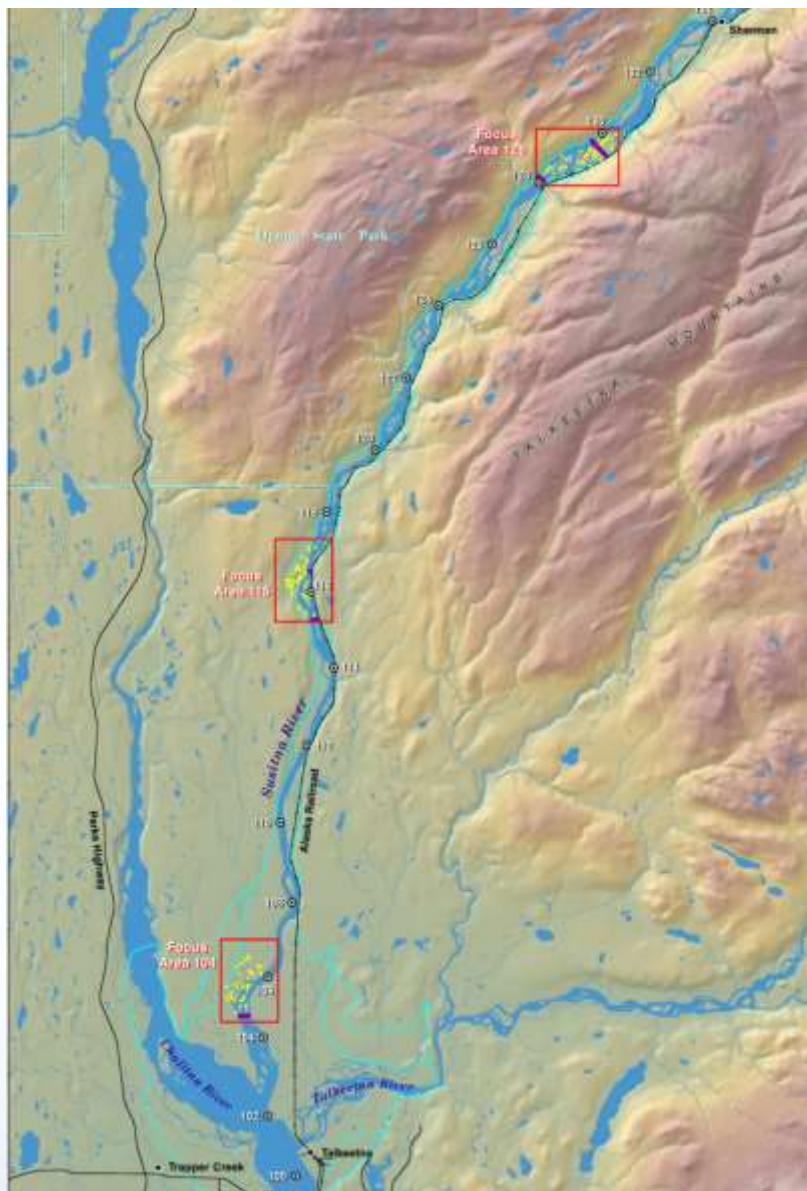


11.6 Riparian Vegetation Study – Field Update

- *Field surveys completed as planned in late April and May (reported in the Q2 TWG meeting), and in June, July, and August:*
 - *During June–August, 62 intensive, permanent ELS plots were established and sampled; vegetation composition and soils data (ABR) and dendrochronology and forest structure data (R2) were collected; the ELS plots are designed to serve as long-term monitoring plots*
 - *During June–August, 214 ITU plots along 35 transects were sampled; the ITU transects span a number of floodplain features and the sample plots are placed in distinct vegetation types; vegetation and soils data are collected at the ITU plots, which are designed primarily to support the mapping of riparian vegetation*



Riparian Vegetation Study: 2013 Focus Areas and Stratified Random Intensive Plot Locations



Susitna-Watana Project
Riparian Focus Area
Stratified Random
Intensive Plots
Map Tiles Overview

Focus Area Map Tile
Intensive Focus Area Plot
IFS Focus Area
Riverine Physiography Area
Project River Mile

ALASKA
DEPARTMENT OF
CORRECTIONS
175 Prince Street, Ste. 2000
Juneau, Alaska 99801
Project Number: 175-175-175-175-175-175
Map Scale: 1:100,000
Map Date: 2013

1:100,000
0 1 2 Miles
0 1 2 3 4 Kilometers

Riparian Vegetation Study: 2013 Non-Focus Areas and Directed Intensive Plot Locations



Susitna-Watana Project
Riparian Non Focus Area
Directed Intensive Plots
Map Tiles Overview

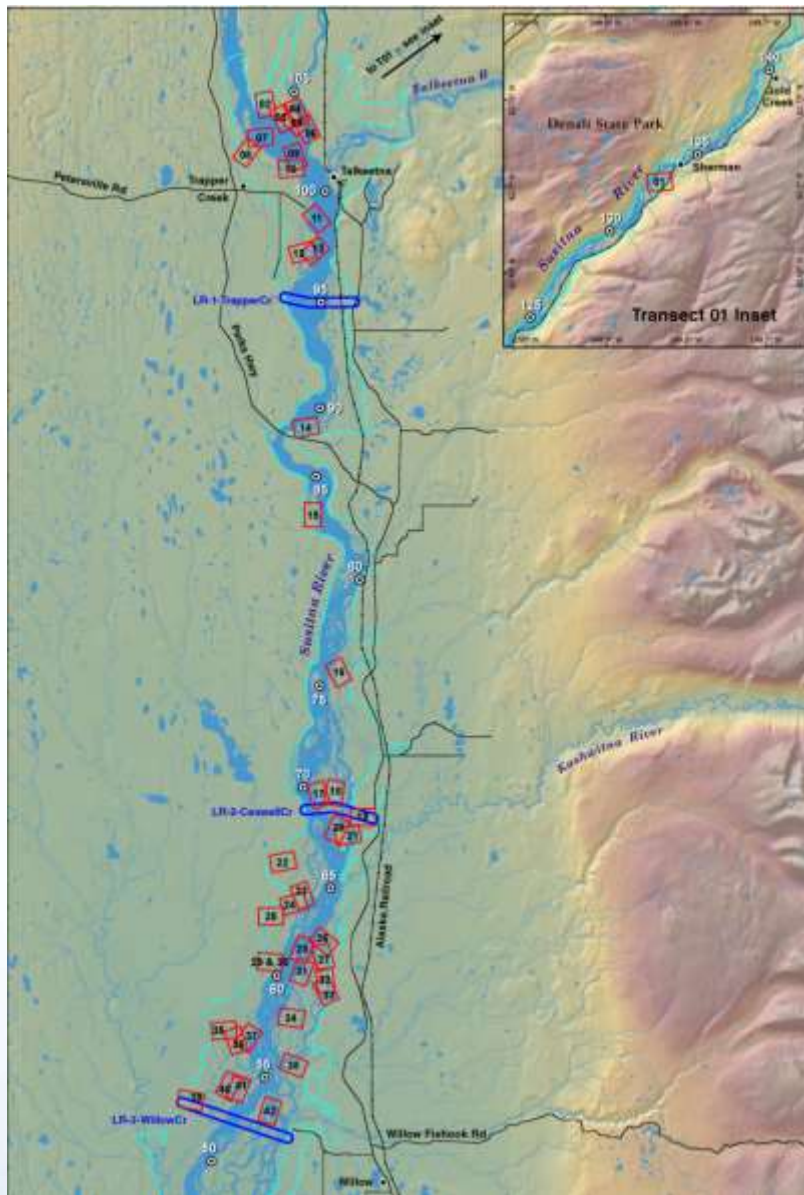
- Non Focus Area Map Tile
- Intensive Non Focus Area Plot
- R2 Lower River Transect
- Riverine Physiography Area
- Project River Mile

ALASKA
ENERGY SERVICE

Leaflet Map: Source: Esri, Inc. © 2013
 2013 Lower River Transect Survey: 2013
 River Map: Upper Susitna GIS: 2013
 Riverine Physiography: 2013
 Map Author: AEP, Inc. - Alaska Gasline, 2013
 AEP, Inc. 2013, 2014, 2015, 2016, 2017, 2018, 2019



Riparian Vegetation Study: 2013 ITU Mapping Transect Locations

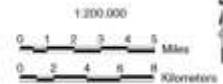


Susitna-Watana Project
Riparian ITU Transect
Map Tiles Overview



- ITU Transect Map Tile
- IFR Lower River Transect
- Riverine Physiography Area
- Project River Mile

Leaflet | Map data © OpenStreetMap contributors, Imagery © Mapbox
 Susitna River Transect Survey, 2013
 River Map Layout: William J. Allen, 2013
 Projection: Alaska State Plane (Zone 4 NAD 83)
 Map Author: RPT, Inc. Alaska Zone Code: 20130401
 481100 500000 500000 500000 500000 500000



11.6 Riparian Vegetation Study – Mapping Update

- *9,484 acres in the study area have been mapped to date*
- *Mapping efforts have been minimal during the summer field season, but will pick up again in the fall*
- *Attributes recorded for each map polygon include:*
 - *AVC Level IV vegetation classes*
 - *Seral vegetation classes (e.g., poplar size classes)*
 - *Riverine geomorphology classes including flood frequency*
 - *Soils information, when applicable*
- *Multivariate riparian ecotypes, wildlife habitats, and wetland classes will be derived from these individual attributes*



11.6 Riparian Vegetation Study – Variances

- *There were no variances from the FERC-approved study plan for the riparian vegetation study*

11.6 Riparian Vegetation Study – Next Steps

- *Field data QA/QC is ongoing*
- *Mapping is ongoing and will continue in earnest this fall and winter*
- *A summary of the 2012 and 2013 field data and current mapping results will be presented in the Initial Study Report, to be filed with FERC on 3 February 2014*

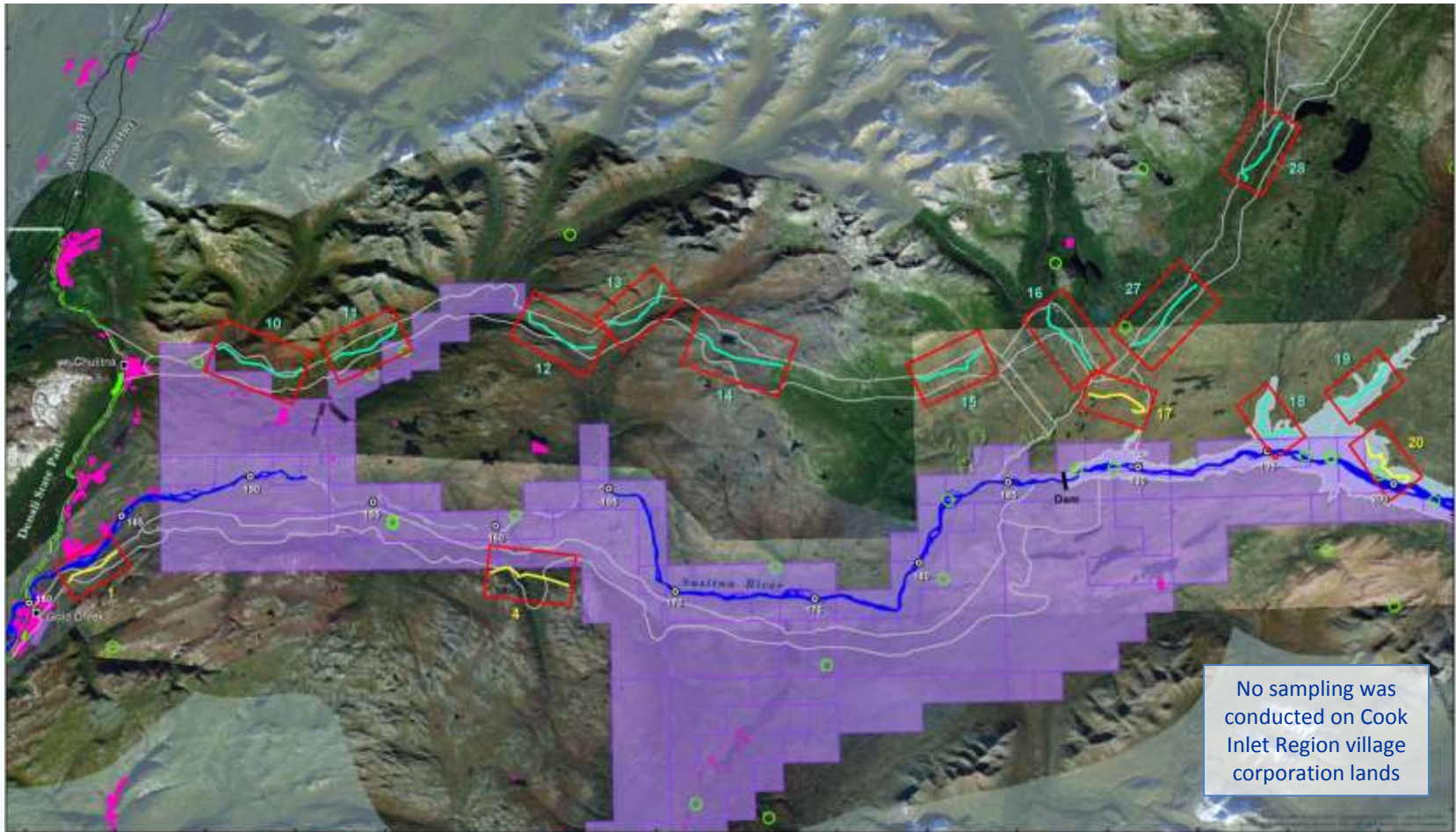


11.8 Rare Plant Study – Field Update

- *Field surveys for rare plants were completed as planned in two field efforts (early July and late July/early August):*
 - *Field transect locations were selected based on a review of the habitat preferences of the rare plant species found within a broad range of the Project area (as described in the FSP, Section 11.8)*
 - *Along each 5-km transect, the plant communities present were surveyed and described, and any unknown or unusual plants were collected and identified; the focus was on species listed as S3 or rarer by the Alaska Natural Heritage Program*
 - *The locations of the rare plants found were recorded with GPS coordinates and population sizes were estimated (as described in the FSP, Section 11.8)*



Rare Plant Study: July 2013 Transect Locations

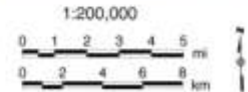


No sampling was conducted on Cook Inlet Region village corporation lands

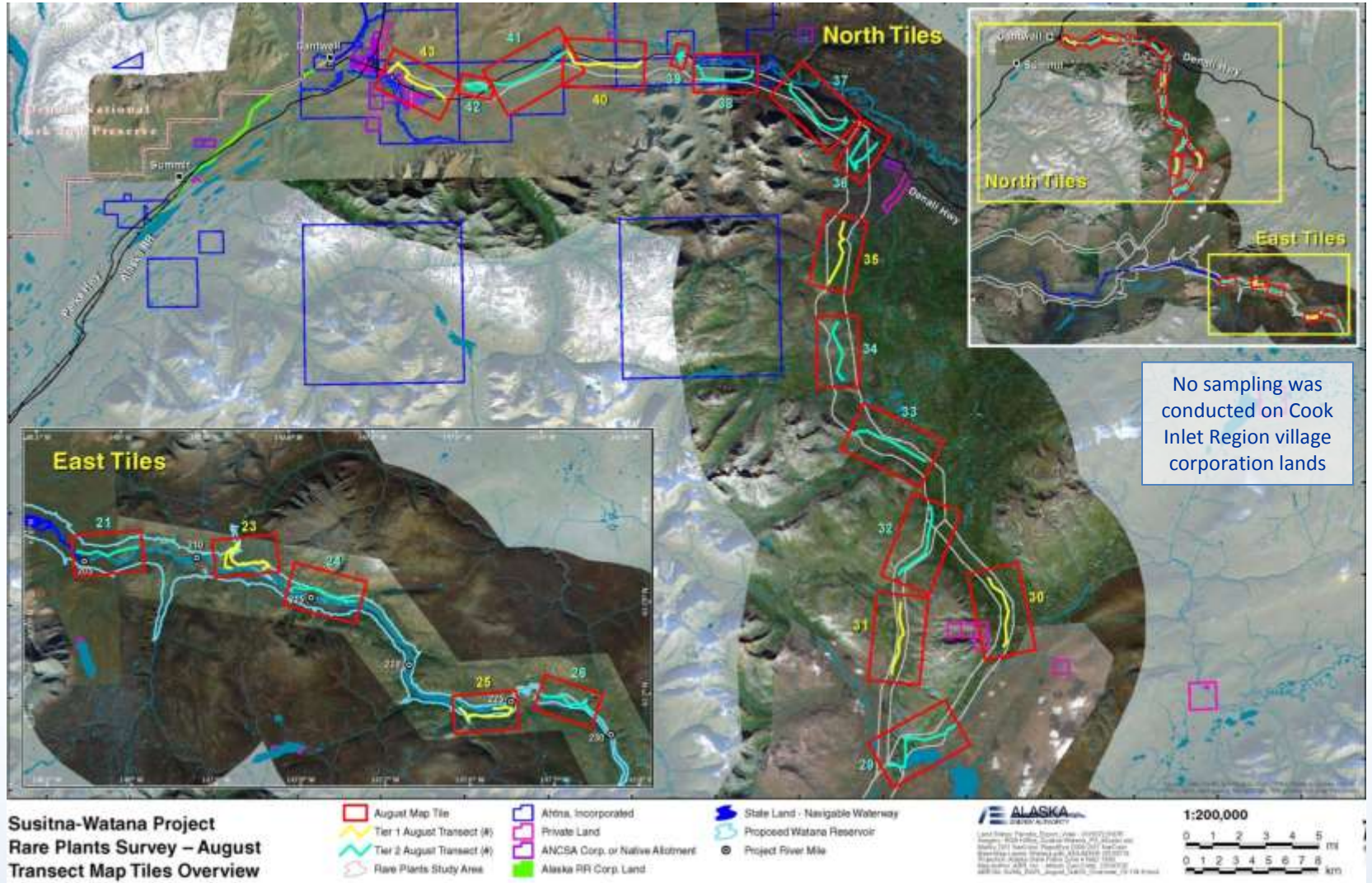
**Susitna-Watana Project
Rare Plants Survey – July
Transect Map Tiles Overview**

- Map Tile
- Tier 1 July Transect (#)
- Tier 2 July Transect (#)
- Raptor Nest 1000-ft Avoidance Buffer
- Private Land
- ANCSA Corp. Land or Native Allotment
- Alaska RR Corp. Land
- State Land - Navigable Waterway
- Rare Plants Study Area and Proposed Project Area
- Proposed Watana Reservoir
- Project River Mile

ALASKA
ENERGY ALTERNATIVES
Last Status Report, Report No. 2013040401
Report No. 1000-ft Raptor Nest Avoidance Buffer, Iss. 20130501
Inquiry: Mailing: 9071 Main Center, Fairbanks, Alaska 99701
Base Map Layers: National GIS, A2(A)M 2010001
Project: Susitna State Paper (2010-4-100)
Map Author: AEP, Inc. - Alaska State Office: 20120808
MDF for Susitna, NAFS, July Overview, 10/10/13



Rare Plant Study: August 2013 Transect Locations



11.8 Rare Plant Study – Results

- *In early July, two rare species were identified and collected: Vicia americana (American vetch) and Eriophorum viridicarinatum (thinleaf cottonsedge); voucher specimens were sent to the University of Alaska Herbarium for confirmation of the field identifications*
- *During the August field work, no known rare plants were identified, though one potentially rare Potamogeton sp. was collected for verification by the University of Alaska Herbarium taxonomic specialists*



11.8 Rare Plant Study – Variances

- *The only variance from the study plan for the rare plant study was the lack of field surveys on Cook Inlet Region village corporation lands (access to those lands was not authorized in 2013)*



11.8 Rare Plant Study – Next Steps

- *Verifications of field identifications of rare species will be obtained by Q4 2013 or earlier*
- *A summary of the 2013 field data and rare plant species occurrences (number of populations, locations, population sizes) in the study area will be presented in the Initial Study Report, to be filed with FERC on 3 February 2014*



11.9 Invasive Plant Study – Field Update

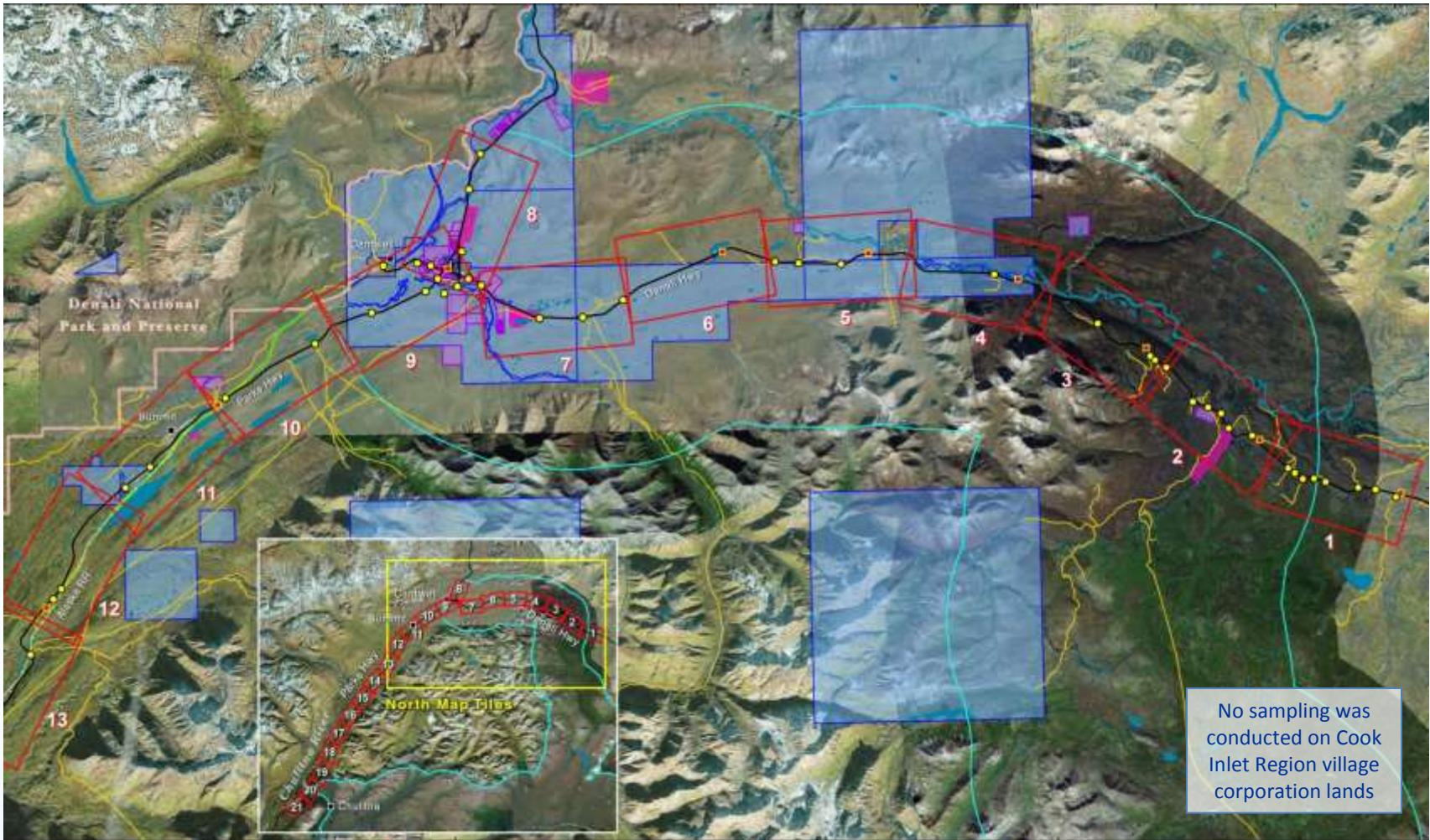
- *Survey locations include possible source areas for invasive plants (the Denali and Parks highway corridors and heavily-used trails that enter the Project area)*
- *Infestations of invasive plants previously documented by the Alaska Natural Heritage Program and other investigators will be revisited*
- *Heavily-used trails from the Denali and Parks highways will be surveyed to assess the risk of invasives entering the Project area along these corridors*



11.9 Invasive Plants – Likely Suspects

Invasive Species Previously Found in Vicinity of Project Area

Scientific Name	Common Name	Invasiveness Rank
<i>Bromus inermis</i> Leyss.	smooth brome	62
<i>Bromus tectorum</i>	cheatgrass	78
<i>Crepis tectorum</i>	narrowleaf hawkbeard	56
<i>Galeopsis tetrahit</i>	brittlestem hempnettle	50
<i>Hordeum jubatum</i>	foxtail barley	63
<i>Leontodon hirtus</i>	rough hawkbit	ND
<i>Matricaria discoidea</i>	pineappleweed	32
<i>Melilotus officinalis</i>	yellow and white sweetclover	81
<i>Phleum pratense</i>	timothy	69
<i>Plantago major</i>	common plantain	54
<i>Poa annua</i> L.	annual bluegrass	44
<i>Poa pratensis</i>	spreading bluegrass or Kentucky bluegrass	46
<i>Polygonum aviculare</i>	prostrate knotweed	52
<i>Sonchus asper</i>	spiny sowthistle	45
<i>Tanacetum vulgare</i>	common tansy	46
<i>Taraxacum officinale</i>	common dandelion	60
<i>Trifolium hybridum</i>	alsike clover	58
<i>Trifolium repens</i>	white clover	57
<i>Tripleurospermum inodorum</i>	scentless false mayweed	59
<i>Vicia cracca</i>	Bird vetch	48



**Susitna-Watana Project
Invasive Plants Survey
North Map Tiles Overview**

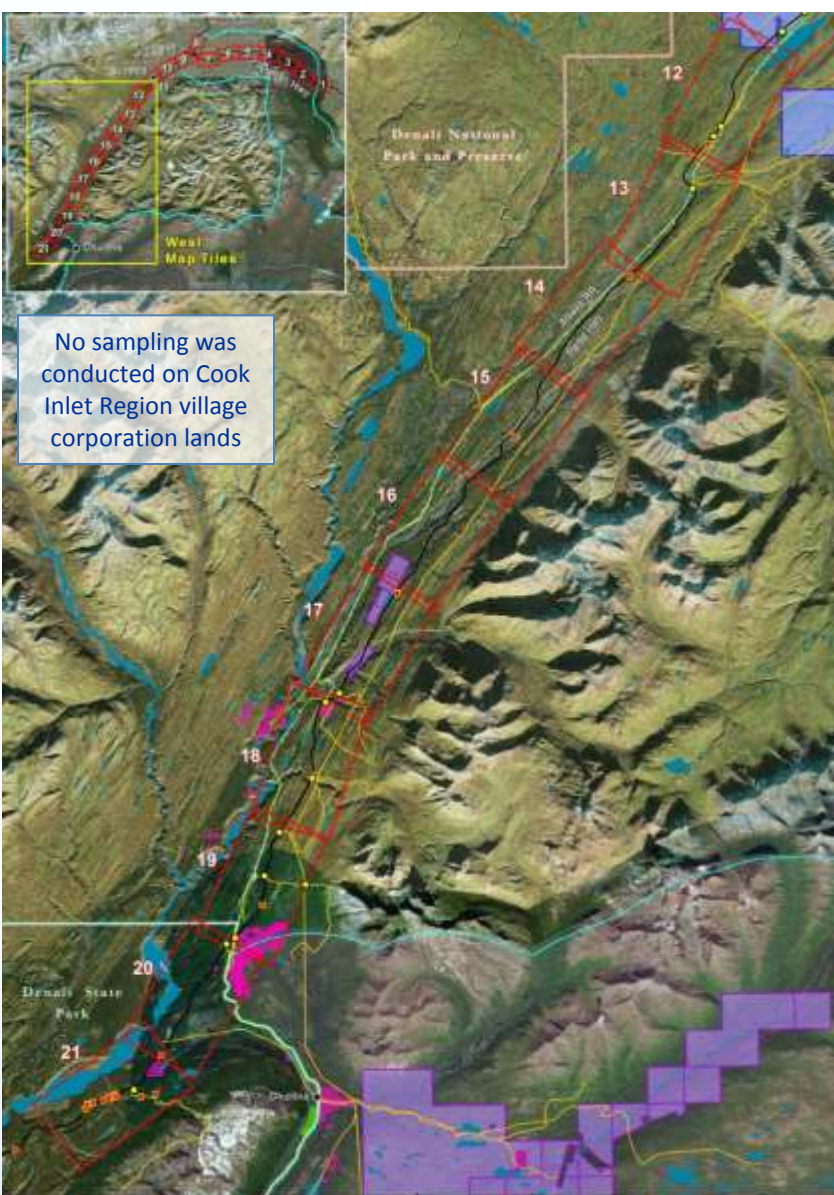
- Map Tile
- Invasive Plants Study Area
- Private Land
- Cook Inlet Region Village Corp. Land or Native Allotment
- Alaska RR Corp. Land
- ABR Point
- Trail
- Aftna, Incorporated
- AKEPIC Point

ALASKA
ENERGY PROJECT

Land Status: Private, Except: State - 2012/01/01/2012
 Imagery: 2014-2015, Aerial, 1:75,000, 100%
 Contour: 2000, 5000, 10000, 20000, 30000, 40000, 50000
 Data Base Source: Alaska GIS, AKA-AIAPR, 10/2010
 Projection: Alaska State Plane Zone 4, NAD 83
 Map Author: SWS, Inc. - Alaska, Zone Code: 10/2010
 SWS Inc. 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022

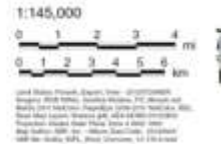


2013 Invasive Plant Survey Locations – Western Section



Susitna-Watana Project
Invasive Plants Survey
West Map Tiles Overview

- Map Tile
- ABR Post
- ★ AKSPC Post
- Invasive Plants Study Area
- Trail
- Aniva, Incorporated
- Private Land
- Cook Inlet Region Village Corp. Land or Native Allotment
- Alaska RR Corp. Land



11.9 Invasive Plant Study – Variances

- *There were no variances from the study plan for the invasive study*

11.9 Invasive Plant Study – Next Steps

- *QA/QC of 2013 field data and develop invasives database for the Project*
- *Confirm identifications of voucher specimens of invasive plants collected*
- *A summary of the 2013 field data and invasive plant occurrences (number of invasive populations, locations, levels of infestation) found in the study area will be presented in the Initial Study Report, to be filed with FERC on 3 February 2014*
- *An Ecological Risk Assessment will be prepared after the second year of data collection (i.e., in 2015 for the License Application)*

