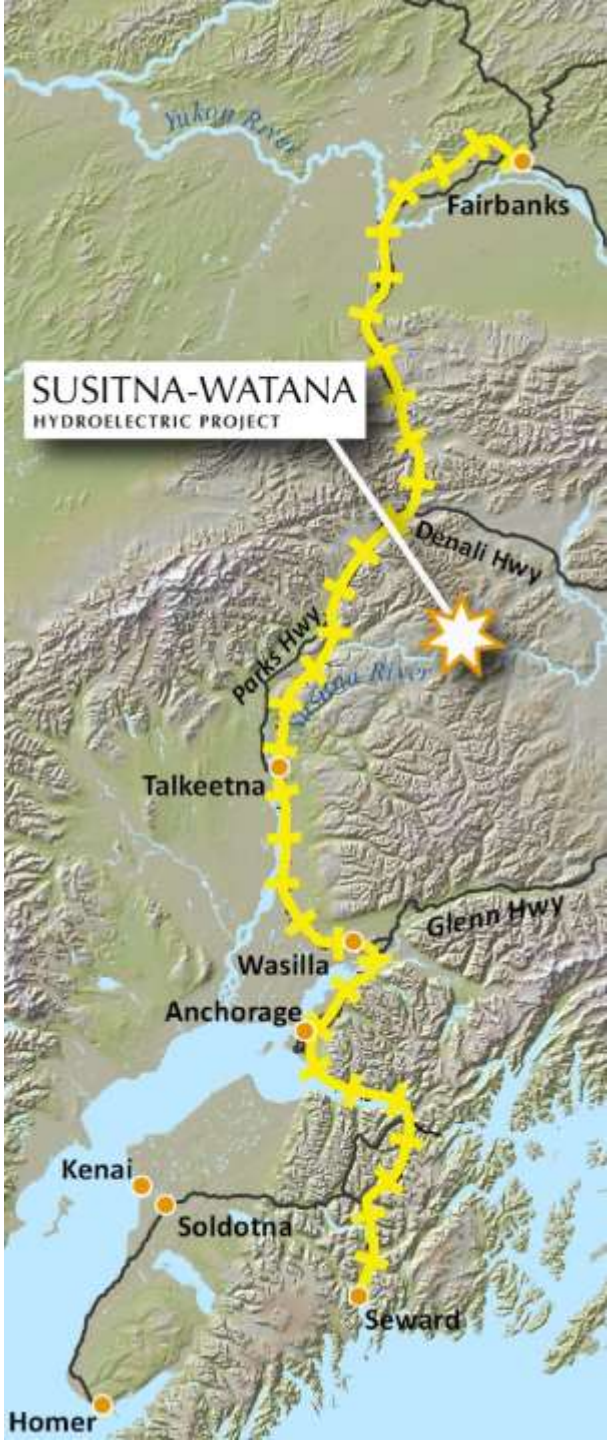

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HYDROELECTRIC PROJECT

Terrestrial Resources Technical Work Group Meeting 3rd Quarter 2013

Wildlife Program Update

September 10, 2013

Prepared by ABR, Inc. —
Environmental Research & Services

ABR inc. environmental research & services

ALASKA ENERGY AUTHORITY

FERC Study Plan Determination, 1 Feb. 2013

- All 16 wildlife studies were included in the 44 studies approved by FERC on this date
- 13 wildlife studies were approved with no modifications:

  10.6 – Caribou
  10.7 – Dall's Sheep
  10.8 – Large Carnivores
  10.9 – Wolverine
  10.10 – Terrestrial Furbearers
  10.11 – Aquatic Furbearers
  10.12 – Small Mammals
  10.13 – Bats
  10.14 – Eagles & Other Raptors
  10.16 – Landbirds & Shorebirds
  10.18 – Wood Frog
  10.19 – Wildlife Habitat Evaluation
  10.20 – Wildlife Harvest Analysis

FERC Study Plan Determination, 1 Feb. 2013

- 3 studies were approved with modifications recommended by FERC staff, in response to ADF&G and USFWS requests:
  - 10.5 – Moose: Remove specific date range of May 15–31 for daily radio-tracking during calving season in 2013 and 2014.
    [*These changes were incorporated in the Final Study Plan (FSP) by AEA*.]
  - 10.15 – Waterbirds: Use 4 observers for concurrent visual observations of migrating birds along 4 transects (cardinal directions) in spring and fall 2013.
    [*These changes were incorporated in the FSP by AEA. After further consultation, however, USFWS was satisfied with the study plan as originally proposed, so this recommendation was dropped, which will be reflected in the Initial Study Report*].
  - 10.17 – Ptarmigan: Increase number of capture sites to 4–6 and substitute Coda net gun and noose carpets as primary capture methods, instead of mist nets.
    [*These changes were incorporated in the FSP by AEA*].

Overview of 3rd Quarter Activities, July–Sep. 2013

RSP Section	Title	3rd Quarter Activity
10.05	Moose	Radio-tracking
10.06	Caribou	Radio-tracking
10.07	Dall's Sheep	Aerial surveys; Initial Study Report (ISR) preparation
10.08	Large Carnivores	Data processing for spatial modeling of bear densities; bear hair-snagging; ISR preparation
10.09	Wolverine	Data analysis; ISR preparation
10.10	Terrestrial Furbearers	DNA lab analyses; prey (hare & vole) population sampling
10.11	Aquatic Furbearers	Mercury literature review
10.12	Small Mammals	No activity (study deferred until 2014)
10.13	Bats	Bat detector operation; roost surveys; ISR preparation
10.14	Eagles/Other Raptors	Nest occupancy & productivity surveys; ISR preparation
10.15	Waterbirds	Brood surveys; begin fall migration surveys; ISR preparation
10.16	Landbirds/Shorebirds	Swallow surveys; data entry & analyses; ISR preparation
10.17	Ptarmigan	Capture & radio-tagging; aerial transect surveys
10.18	Wood Frog	Data analysis; detectability & occupancy modeling; chytrid fungus sample analysis; ISR preparation
10.19	Wildlife Habitat Evaluation	No activity (study deferred until 2014)
10.20	Wildlife Harvest Analysis	No activity (study deferred until 2014)

Study Plan Variances

- Lack of access to Cook Inlet Region village corporation lands (mostly in western reservoir zone and Gold Creek corridor) required adjustment of sampling designs for studies with ground-based sampling components (furbearers, moose browse survey, bats, landbirds & shorebirds, wood frog).
- Cold spring and delayed breakup caused delays in field surveys for raptors, aquatic furbearers (muskrats), waterbirds, landbirds & shorebirds, wood frog.
- Three wildlife studies were deferred until 2014:
  - 10.12 – Small Mammals
  - 10.19 – Wildlife Habitat Evaluation
  - 10.20 – Wildlife Harvest Analysis.

Wildlife Study Program Updates

- ADF&G studies (update by Mark Burch):
  - 10.5 – Moose
  - 10.6 – Caribou
  - 10.7 – Dall's Sheep (aerial survey)
  - 10.8 – Large Carnivores (bear population density modeling)
  - 10.9 – Wolverine
  - 10.17 – Willow Ptarmigan
- University of Alaska Fairbanks study (update by Laura Prugh)
  - 10.10 – Terrestrial Furbearers
- Studies by ABR, Inc. (update by Brian Lawhead):
  - 10.7 – Dall's Sheep (mineral lick observations)
  - 10.8 – Large Carnivores (bear hair-snares at salmon spawning streams)
  - 10.11 – Aquatic Furbearers
  - 10.12 – Small Mammals
  - 10.13 – Bats
  - 10.14 – Eagles/Other Raptors
  - 10.15 – Waterbirds (including radar/visual study of migration)
  - 10.16 – Landbirds/Shorebirds
  - 10.18 – Wood Frog
  - 10.19 – Wildlife Habitat Evaluation
  - 10.20 – Wildlife Harvest Analysis

— Presentation Break —

- See separate presentation by ADF&G Division of Wildlife Conservation

Caribou crossing Susitna River near Fog Creek, 11 May 2013.

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Study 10.10 — Terrestrial Furbearers

- Preliminary genetic analyses:
  - DNA from scats (red fox, coyote) and hair samples (lynx, marten) collected in January–April 2013 are being processed in Dr. Laura Prugh's lab at UAF, to be completed this fall.
- Furbearer resource-use data analysis:
  - Track data collected during winter 2013 are being analyzed using *Program MARK.*
  - Spatial and habitat-specific occupancy models will be generated for each target species (coyote, red fox, lynx, marten).
- Prey population indices (small mammal abundance surveys):
  - Field sampling conducted during June, July, and August 2013.
  - Survey sites established in 2012 that were still accessible in 2013 were resurveyed (several on Cook Inlet Region village corp. lands were not).
  - New sampling sites were established for both surveys.

Study 10.10 — Prey Population Indices

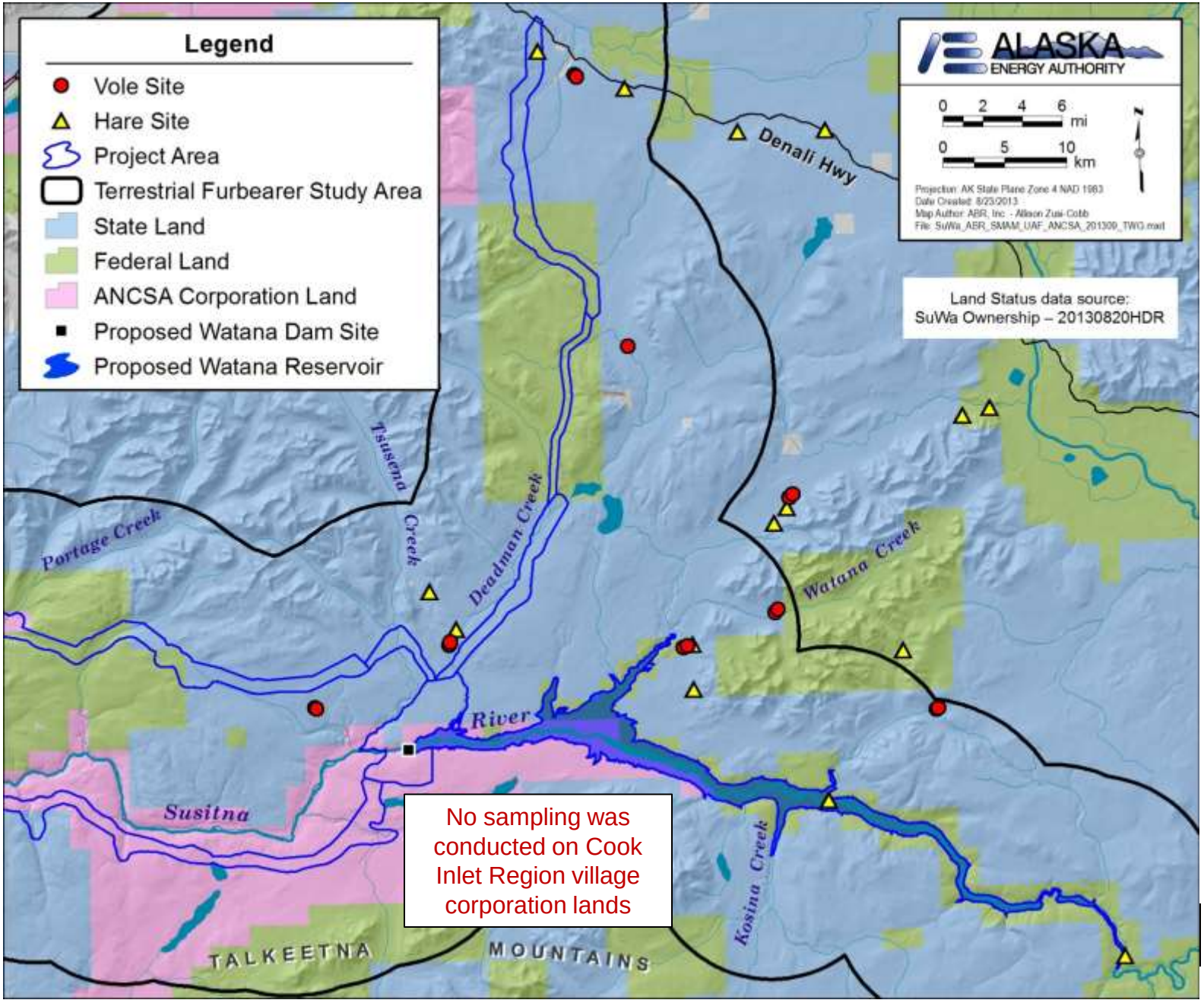
Snowshoe hare sampling:

- Counts of fecal pellets were conducted June 12–15 and July 15–24.
- 15 grids (50 survey plots each) were surveyed:
  - 4 grids established in 2012 were resurveyed.
  - 11 new grids were established.
- Pellet counts were highly variable among grids (range = 24–2,258) and areas of high use appeared to be highly localized.
- This variability may reflect the low phase of the hare population cycle.

Vole sampling:

- Live-trapping sessions were conducted August 2–13.
- 15 grids (100 traps each) were surveyed:
  - 1 grid established in 2012 was resurveyed.
  - 14 new grids were established.
- 3 vole species were captured: red-backed vole, meadow vole, singing vole.
- Low capture rates among all survey sites (14 voles in 1,500 trap-nights) indicate low population density in 2013.

2013 Hare and Vole Survey Locations



Study Plan Variances for 2013 Prey Population Indices

- Snowshoe hare survey:
  - Grid locations were placed in suitable regions of the study area with contiguous habitat characteristics (dividing the study area into large survey blocks, as described in the study plan, proved impractical).
  - The number of survey sites was increased from 8–10 grids to 15 grids.

- Vole survey:
  - The number of trap-nights per grid was shortened from 1–5 nights to a single night, to increase the area sampled.
  - Mark–recapture sampling was dropped in favor of direct enumeration.
  - Data from the 1-night trapping sessions will be calibrated to 5-night trapping sessions conducted in Denali National Park & Preserve to generate abundance estimates.
  - Trap grid size was increased from 50 traps/grid to 100 traps/grid.
  - The number of survey grids was increased from 8–10 to 15.

Study 10.7 — Dall's Sheep (mineral licks)

- Field observations at Jay Creek and Watana Creek licks:
  - Watana Creek lick: 3 sheep nearby on May 28; 2 sheep nearby on June 19.
  - Jay Creek lick: 4 sheep present on May 29; 5 sheep present on June 20. Sheep were seen moving from the lick northwest to nearby mountains on both visits.
  - A time-lapse camera (10-minute intervals) was deployed at Jay Creek on May 29.

- 3,140 photos were recorded during May 29–June 20, 2013.
- Camera was too far from lick for high-quality photos, but sheep were discernible.
- A bear tilted the camera on May 30 and 31, reducing the field of view somewhat.
- Sheep were recorded on the cliffs at the main lick on most days, numbering 1–4 animals.

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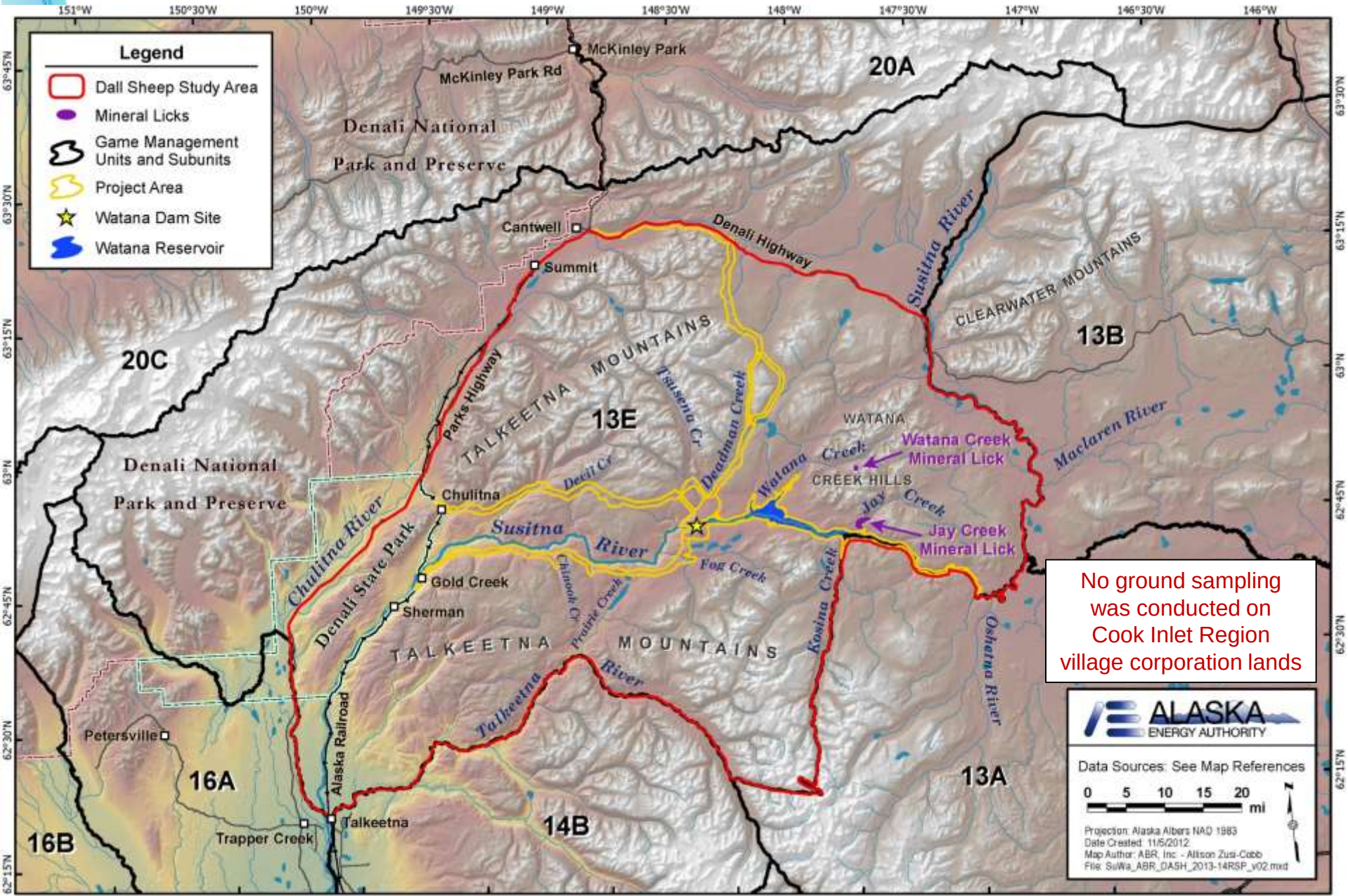
Dall's Sheep Study Area



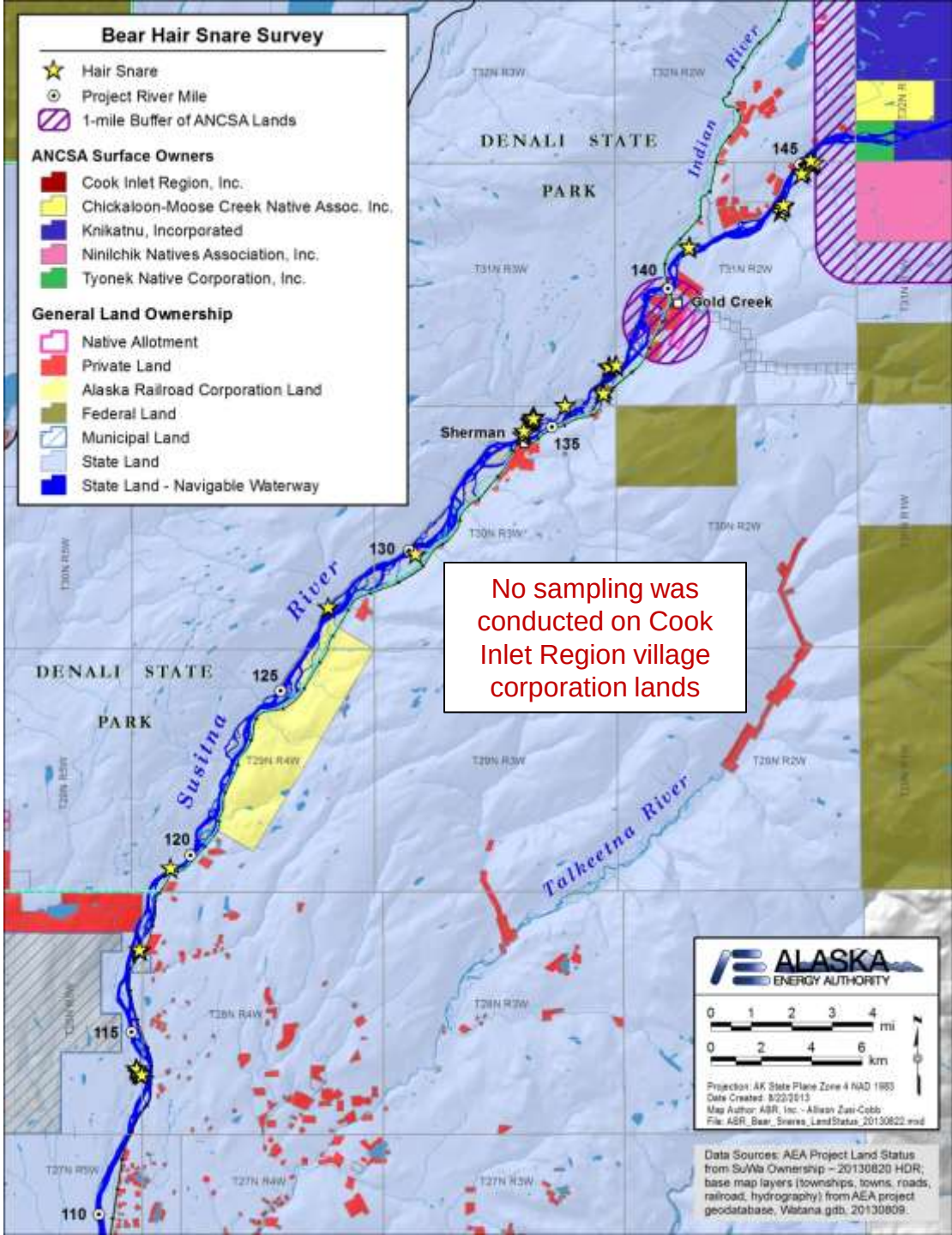
Study 10.8 — Large Carnivores

- Nonlethal, single-catch snares are being used to snag hair samples from bears using salmon spawning streams and sloughs downstream from the dam site.
- Sampling began July 23 and is planned to end about September 27.
- Hair samples will be analyzed for DNA to provide minimum estimate of number of bears using streams and sloughs, plus stable isotopes to characterize diet composition.

Locations of Bear Hair Snares, July–August 2013

As of early September:

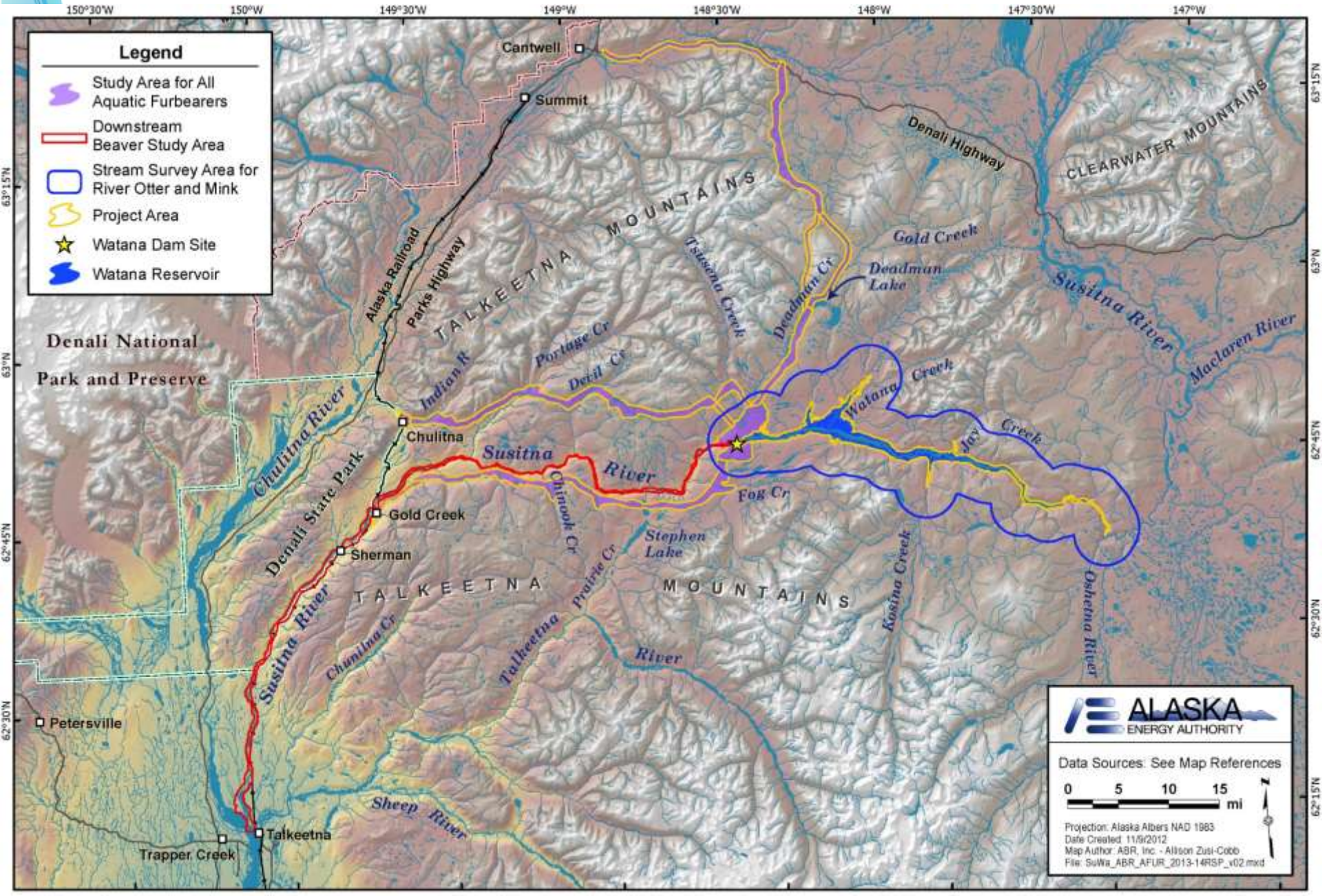
- Total of 52 snares have been deployed in 10 general locations (sloughs & tributaries)
- Several were removed due to flooding during high-water event in August
- 43 snares currently deployed
- 53 hair samples collected from 26 different snares



Study 10.11 — Aquatic Furbearers

- Transect surveys for tracks of river otters and mink were not flown in late winter 2013; instead, sightings were recorded during helicopter surveys for terrestrial furbearer tracks, waterbird migration, and raptor nest occupancy; track surveys are planned next winter (November–March).
- No furs of trapped river otters were obtained for mercury sampling in winter 2012–2013 because no carcasses were presented to ADF&G for sealing from the study area. Hair snagging will be attempted in winter 2013–2014 around locations where otters and mink are seen on aerial surveys. If that fails to produce usable samples, an experienced trapper will be hired for a dedicated trapping effort in the study area.
- Aerial survey of muskrat sign ("push-ups" on pond and lake ice) planned for April 2013 was cancelled due to late spring; instead, comparable data on muskrat sign were collected during waterbird migration and raptor nest surveys (first sign was noted in 3rd week of May due to persistent ice cover).
- Aerial survey of active beaver colonies (lodges & fresh food caches) is planned in October, before freeze-up.

Aquatic Furbearer Study Area



Study 10.13 — Bats

- 20 Anabat® detector stations were deployed in late May for automated recording of bat vocalizations until early October, with data card exchanges every 2 weeks.
- 40 sampling points were selected randomly after habitat stratification, with final 20 being selected after field inspection (8 ponds, 4 streams, 4 cliffs, 4 upland sites).
- Potential roosting habitats (cliffs, rock crevices, snags) were surveyed and mapped in late June.
- Human structures were identified in and near the study area and owners were contacted for permission to search for potential roosts in mid-August.

- First detection of a little brown bat (*Myotis lucifugus*) occurred on May 25, when ponds were still frozen.
- Through mid-August, bat vocalizations had been detected at 14 of 20 (70%) sampling sites, but no roosts have been located yet.

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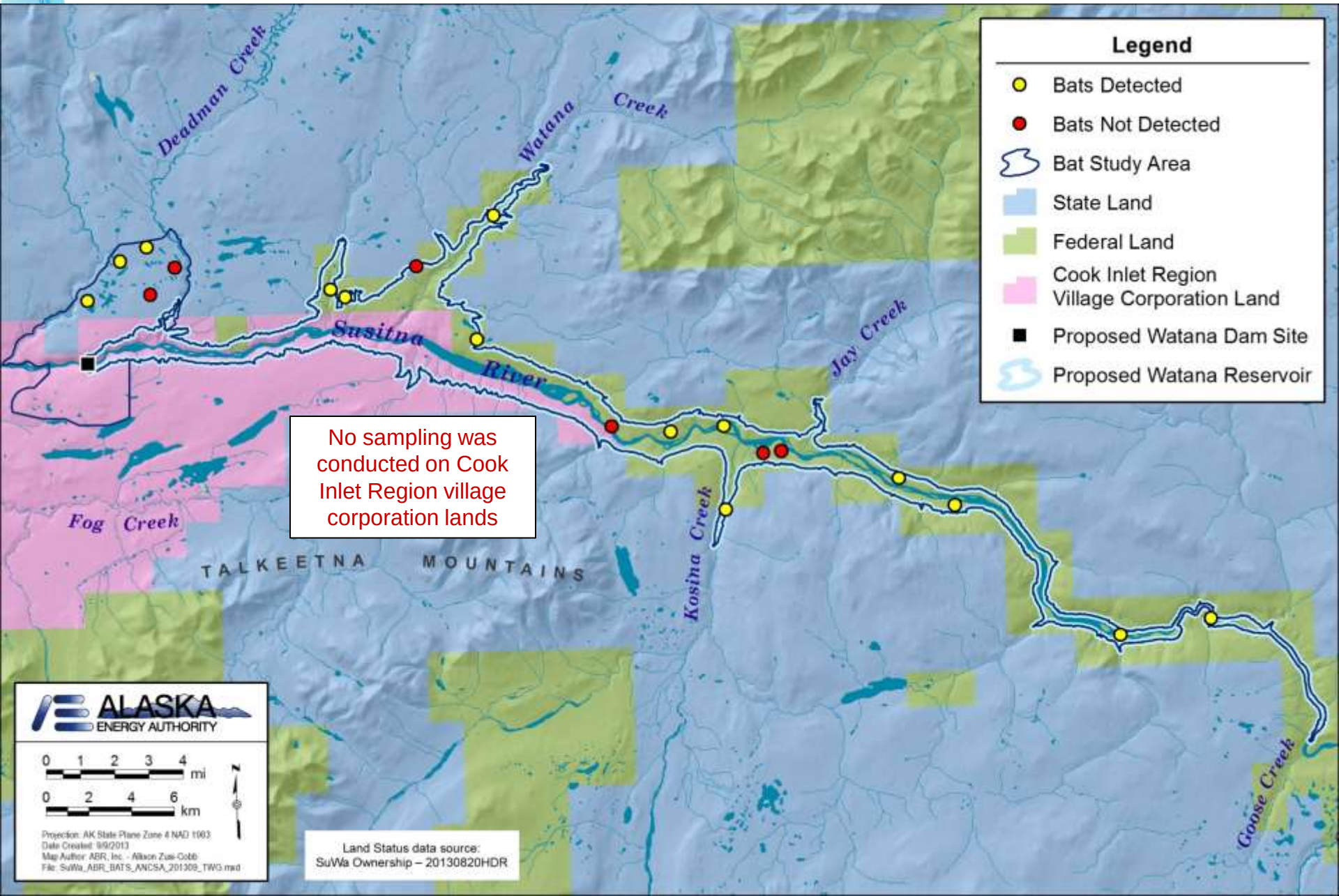
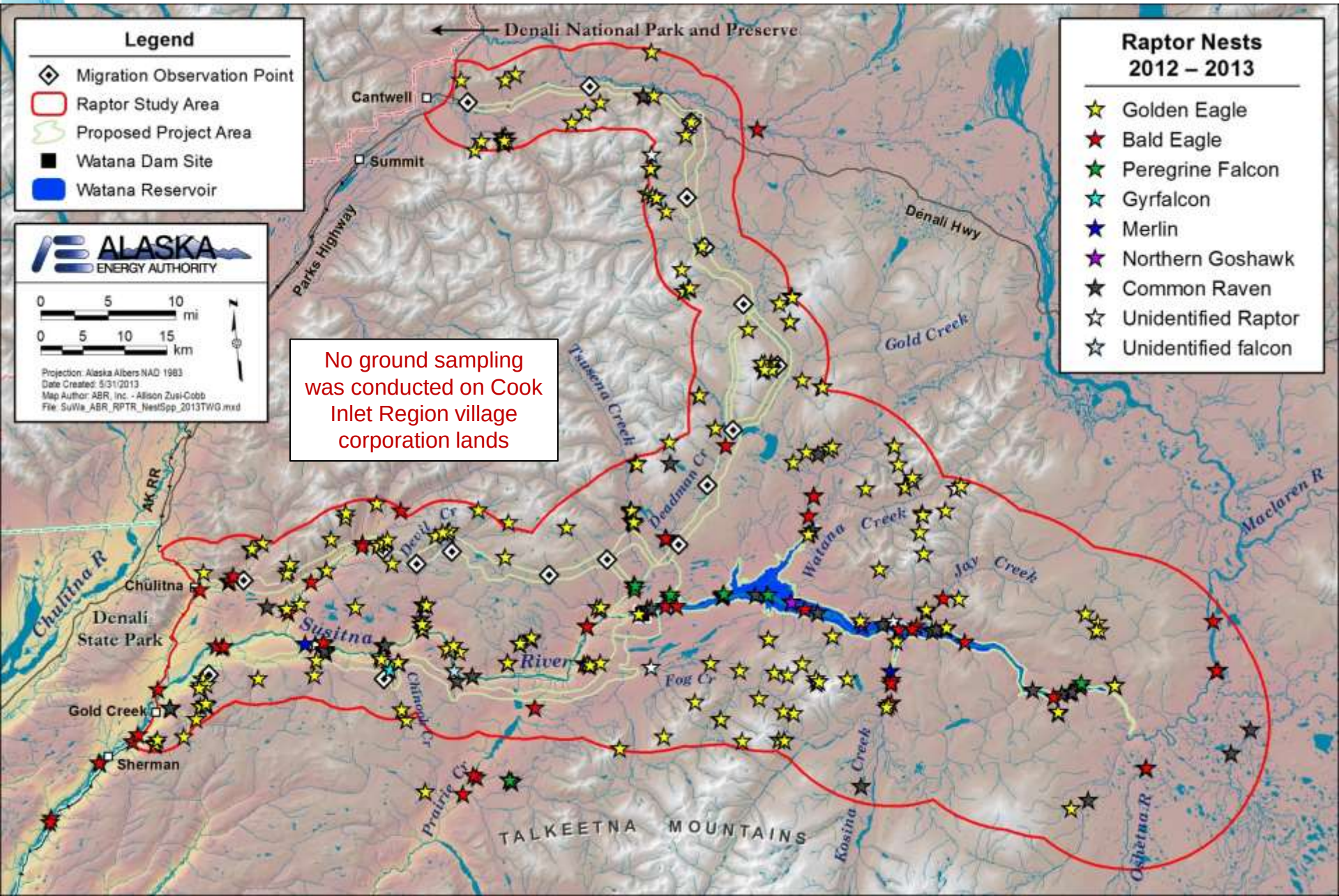
Bat Study Area



Study 10.14 — Eagles & Other Raptors

- Helicopter-supported, ground-based observations were used to study migration from 18 observation points located in or near potential transmission-line corridors (avoiding Cook Inlet Region village corporation lands) during April 12–May 11.
- Helicopter surveys were flown to locate nests and quantify occupancy during May 4–12 and May 19–24.
- Expansion of study area from 2012 required 2 helicopters for nest occupancy surveys in early May and resulted in the discovery of numerous additional nests.
- Late spring and delayed melt resulted in persistent snow cover on cliff nests and delayed nesting by eagles and other raptors.
- Resurveys of subsamples to evaluate detectability were flown later than planned due to late snowmelt.
- Nest productivity was evaluated on surveys flown during July 6–11 and July 29–30, which indicated that productivity and success were low, consistent with the late spring and current low phase of the snowshoe hare population cycle.
- Fall migration will be studied using helicopter-supported, ground-based observations during September 15–October 15 (avoiding Cook Inlet Region village corporation lands).
- Late fall/early winter roosting and staging surveys will be conducted from October to December.

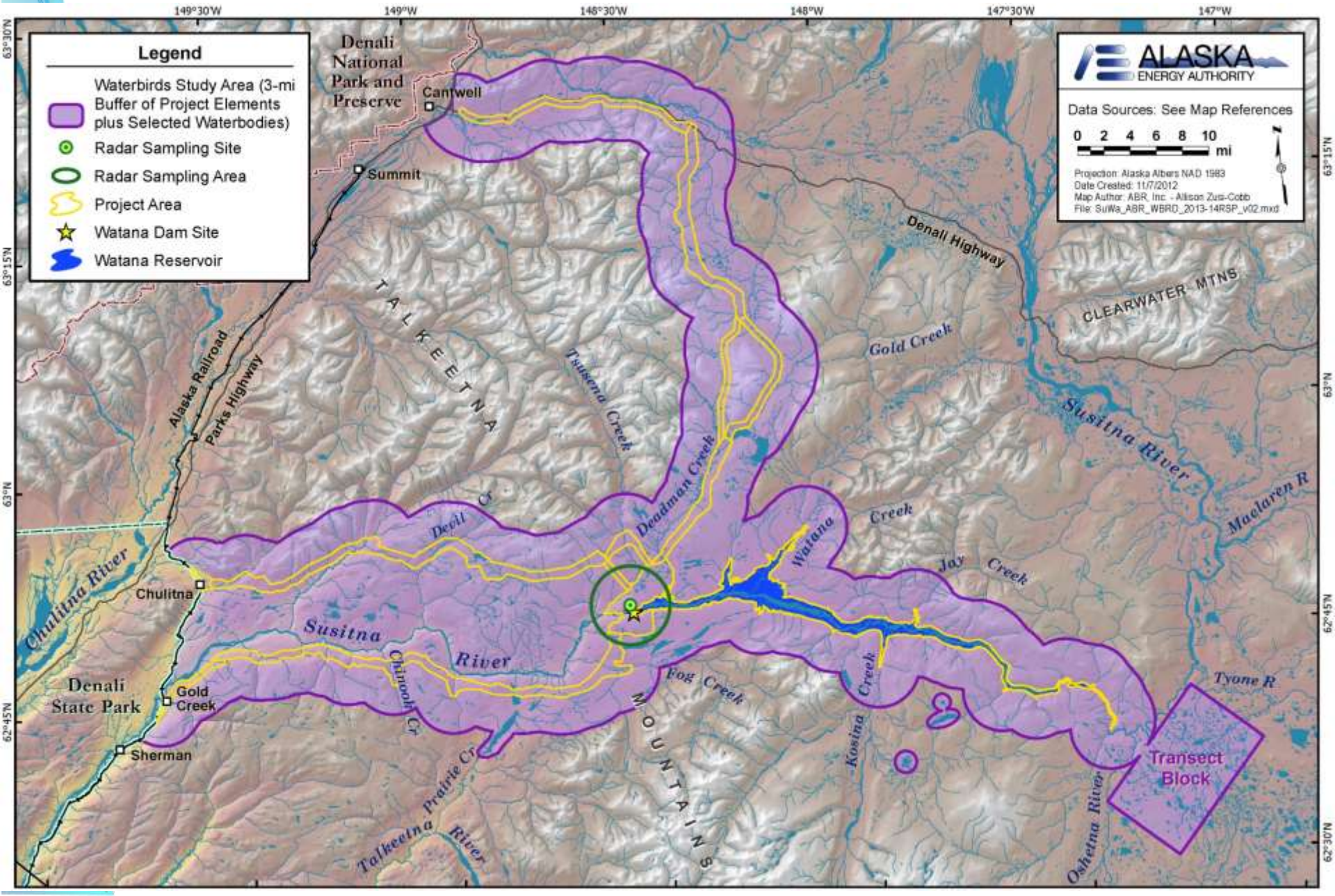
Study Area for Eagles & Other Raptors



Study 10.15 — Waterbirds (aerial surveys)

- Waterbird aerial surveys were designed to document the timing, species composition, and numbers of waterbirds migrating through, and breeding in, the study area.
- Surveys are flown at 200–500 ft agl in a Robinson R-44 piston helicopter.
- Surveys cover major drainages and lake complexes within 3 miles of the Susitna River from the railroad bridge crossing near Indian River upstream to the Tyone River and of the Nenana River between Seattle Creek and Cantwell.
- Migration surveys were not postponed due to the late spring, but early surveys were of short duration due to the persistence of ice.
- Migration surveys (April 23, 29; May 5, 11, 18–19, 23–24, 28–29) recorded 38 species of waterbirds.
- Breeding surveys (June 1–5, June 14–17) recorded 32 species of waterbirds (including Harlequin Duck) as confirmed or probable breeders.
- Brood surveys (July 20–22; August 1–5, 14–18) confirmed that the timing of breeding in 2013 was fairly similar for dabbling and diving ducks (i.e., the normal timing pattern appeared to have been “telescoped” by the late spring).
- Fall migration surveys began in mid-August and will continue until mid-October.

Waterbird Study Area



10.15 — Waterbirds (radar/visual migration surveys)

- A 4-person tent camp was established on state land just northwest of the proposed dam site to monitor all bird movements (both day and night) during spring and fall migration.
- Both radar and visual surveys are conducted from fixed locations.
- A portable marine radar, powered by a portable generator, is used in both surveillance and vertical modes during all nocturnal and 3 diurnal hours (dictated seasonally by night length) to record the flight patterns, numbers, and behavior of all birds within 6 km (3.75 miles) of the site.
- During a portion of the night, an observer also uses night-vision equipment to record the relative numbers of different species flying through the area.
- During diurnal periods, visual observers record numbers, flight characteristics, and behaviors of all birds observed within 10 km (6.2 miles) of the site.
- Observations were conducted at the camp site 24 hours per day throughout a 45-day period in the spring (20 April–3 June) and are being conducted during a 60-day period in the fall (15 August–15 October).

Radar/Visual Migration Survey Site

Radar Sampling Site
Radar Sampling Area
Proposed Project Area
Proposed Watana Reservoir
Proposed Watana Dam Site
Cook Inlet Region, Inc. Land
Knikatnu Native Corp. Land
Tyonek Native Corp. Land

Data Sources: Radar sampling site and area from ABR, Inc., 20121107; Project Area from MWH Global, 20121026; Watana Dam and Reservoir from MWH Global, 20120829; Parcel land status data from Matanuska-Susitna Borough GIS Division and Dryden and LaRue, 20120816; Project imagery from Matanuska-Susitna Borough LiDAR/Imagery Project: Bare Earth DEM Hillshade from LiDAR, 2011

Tsusena Creek

Deadman

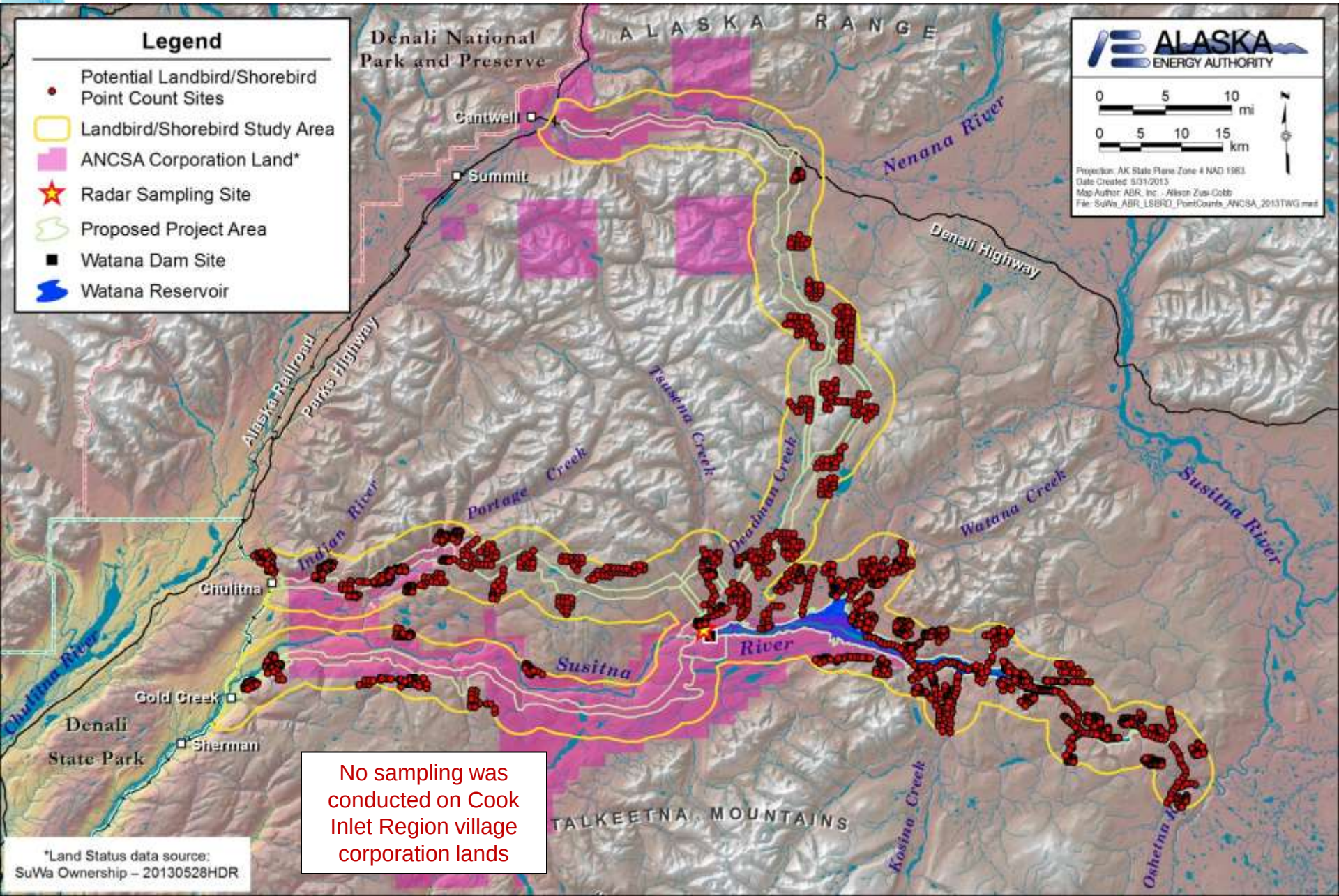
Susitna River

No ground sampling was conducted on Cook Inlet Region village corporation lands

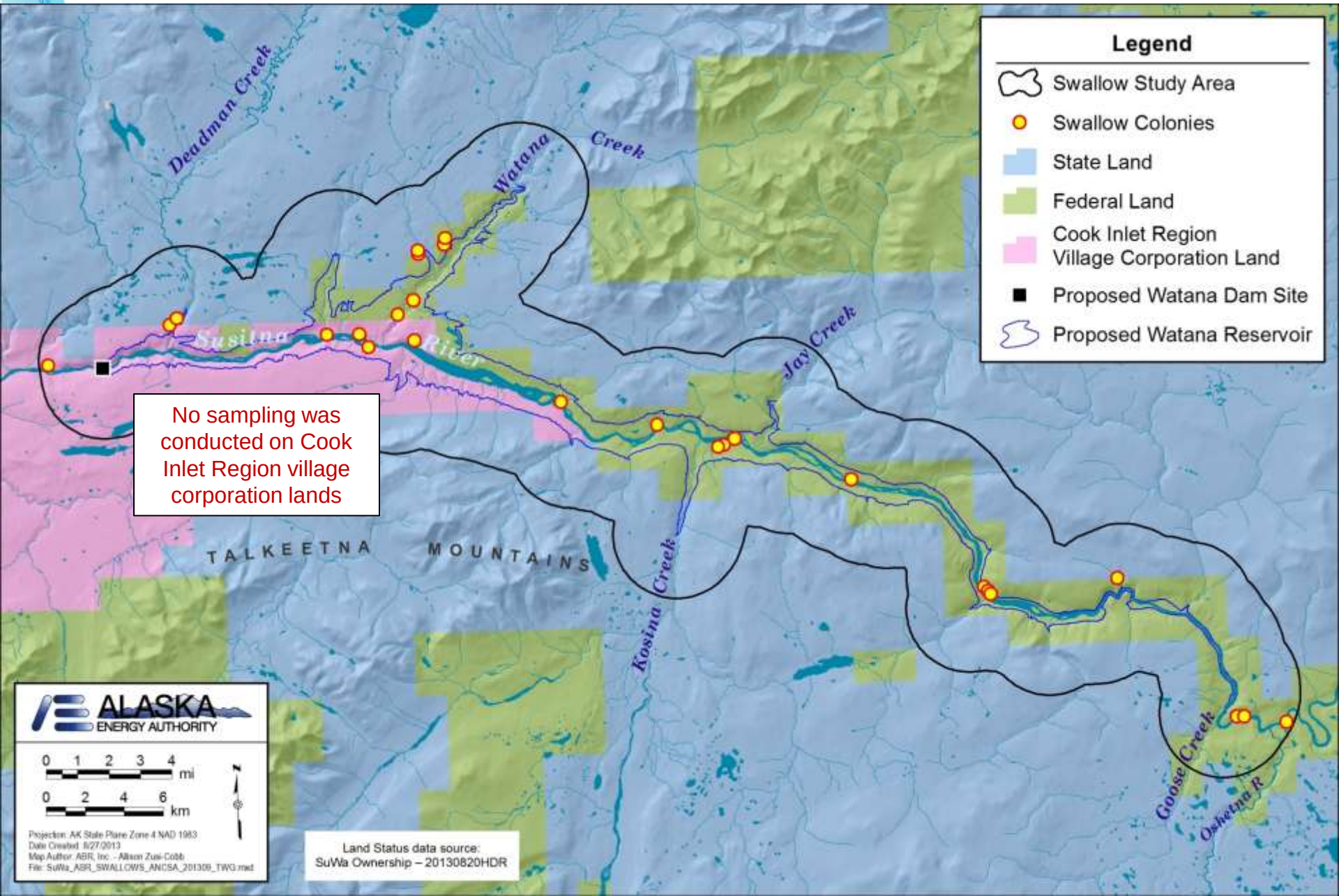
Study 10.16 — Landbirds & Shorebirds

- Primary method was early morning point-count surveys to detect singing male birds occupying breeding territories; riparian transects also were sampled.
- Point-count surveys began on May 23 and continued until June 20.
- 8 biologists (4 crews of 2 each) were based at Stephan Lake Lodge.
- 1,367 point-count stations were sampled on 113 different transects (point locations were stratified by vegetation type).
- Sampling design was revised to avoid Cook Inlet Region village corporation lands, so those lands will need to be sampled in 2014 if land-access permits are granted.
- Habitat-association analyses can combine data across both years, but abundance analyses (breeding densities) will need to be conducted separately by year.
- Unusually cold spring and late snowmelt delayed start of surveys about 1 week; adaptive timing of sampling was used in different parts of the study area due to melt patterns (surveys followed snow melt to west and up in elevation).
- Riparian transects were similarly delayed by late snowmelt, high water levels, and attendant safety concerns, but all were completed by June 20.
- Swallow colony surveys were conducted during July 1–3 and July 15–16, locating 26 colonies (mostly Bank Swallows, few Violet-green Swallows) containing from 1 to 354 burrows (mean = 37 burrows) in the reservoir inundation zone.

Landbird/Shorebird Study Area & Sampling Points



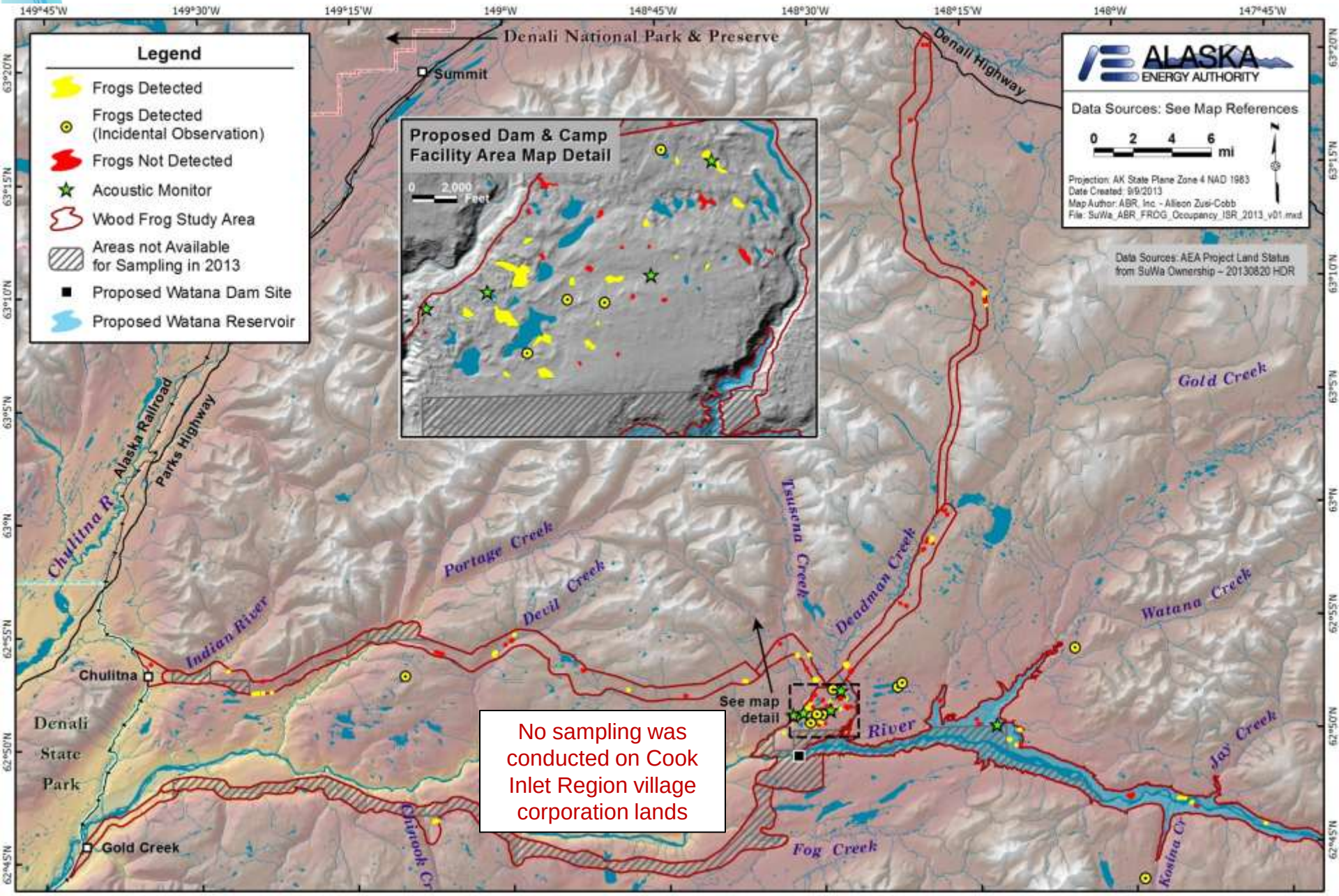
Swallow Colony Locations



Study 10.18 — Wood Frog

- Objective was to investigate occurrence and habitat occupancy in the study area (reservoir inundation zone, camp/facilities area, road corridors).
- Primary sampling method was auditory survey to detect calling male frogs during the spring breeding season; egg masses also were recorded when seen (13 total).
- Frogs captured opportunistically by hand (*n* = 7) were swab-sampled for the presence of *Batrachochytrium dendrobatidis* (Bd, or chytrid) fungus. Receipt of lab results is pending.
- Surveys were conducted at 90 sampling sites by 2 crews of 2 observers each, staggering the timing of visits to accommodate repeated visits, if necessary, during the sampling period (May 30–June 9).
- Start of surveys was postponed about 2 weeks due to cold, late spring and delayed melt.
- Detectability was assessed through multiple site visits and deployment of acoustic monitors at 5 sites where frogs were detected on the first survey.
- Wood frogs were detected at 47 of the 90 sites sampled and the probability of detection was estimated to be 61% from a single visit, 85% from two visits, and 94% from three visits.

Wood Frog Study Area & Sampling Locations

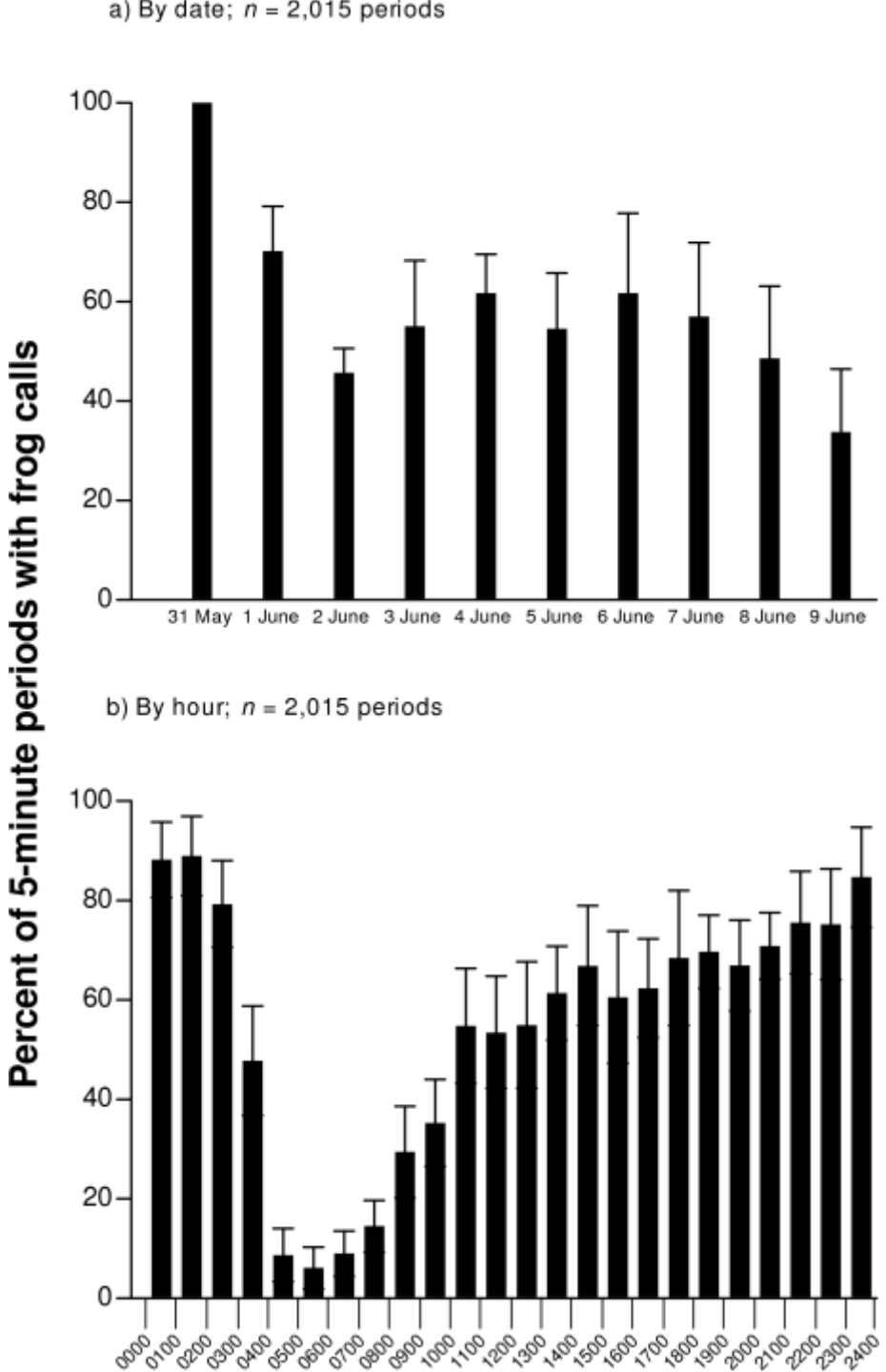


No sampling was conducted on Cook Inlet Region village corporation lands

Wood Frog Calling Activity

Acoustic monitor

Frog egg mass



Questions?

Caribou mineral lick near Sally Lake, north of reservoir inundation zone, 13 August 2013.

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