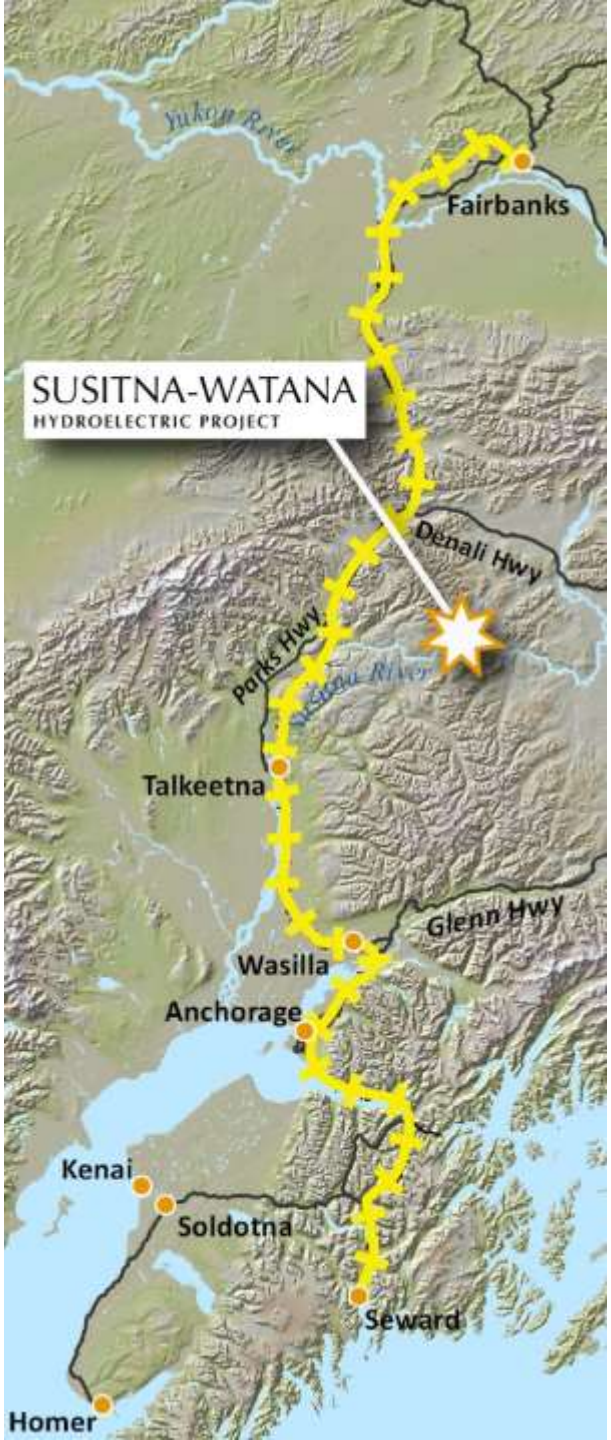


SUSITNA-WATANA
HYDROELECTRIC PROJECT

Terrestrial Resources

Wildlife Program

Agency Consultation Meeting

March 6, 2014

Prepared by ABR, Inc. —
Environmental Research & Services

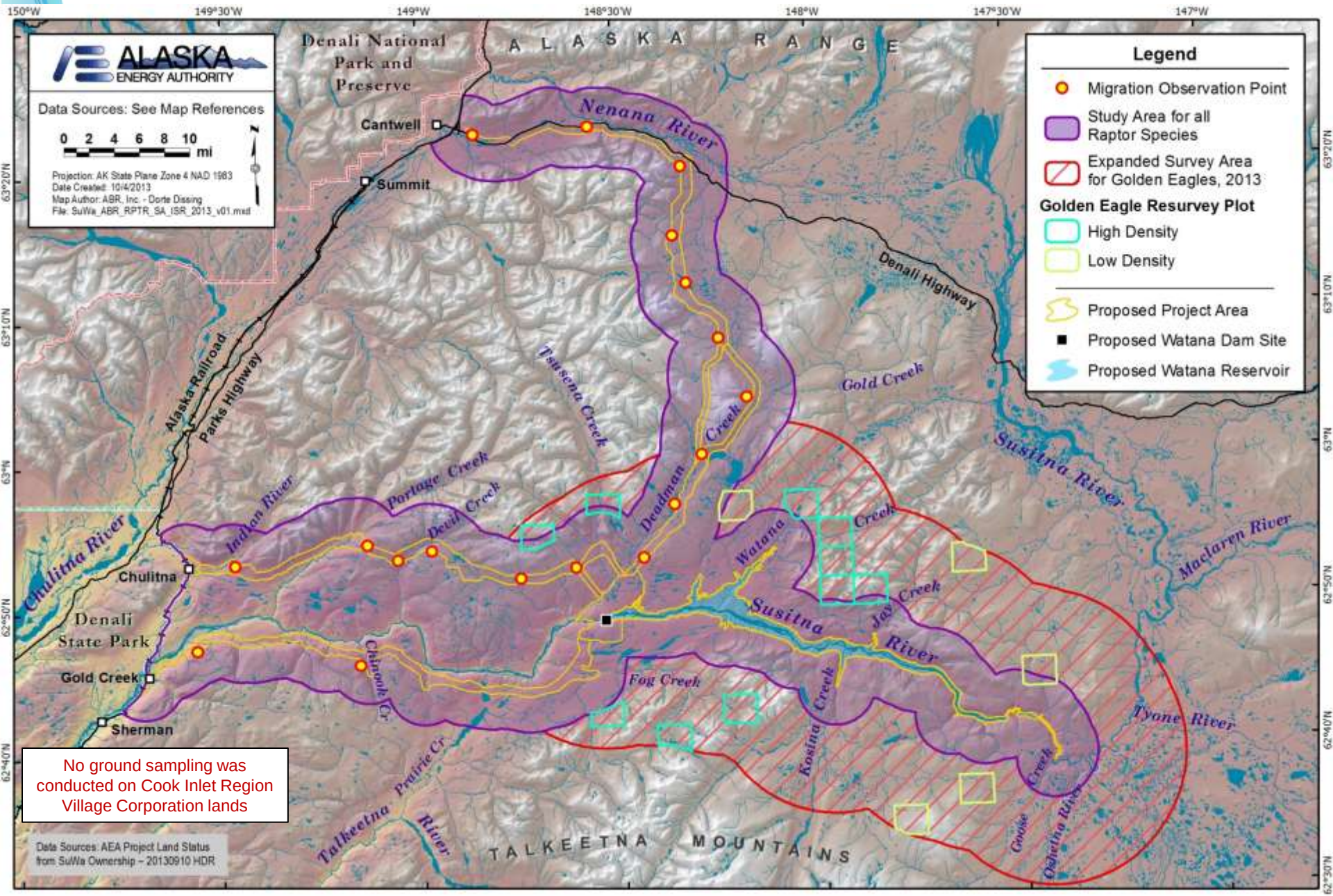
ABR inc.
environmental research & services

ALASKA ENERGY AUTHORITY

Overview of Wildlife Plans for 2014

Study	Subject	Plans for 2014
10.5	**Moose**	Radio-tracking continuing; browse survey (year 2) deferred to 2015.
10.6	**Caribou**	Radio-tracking continuing.
10.7	**Dall's Sheep**	Mineral lick observations + aerial surveys to complete study.
10.8	Large Carnivores	Bear density modeling completed; analyses of bear hair samples from 2013 in progress; completion deferred to 2015.
10.9	**Wolverine**	SUPE survey to be completed, pending suitable conditions.
10.10	**Terrestrial Furbearers**	Year 2 of field surveys currently in progress, with modifications.
10.11	**Aquatic Furbearers**	Winter track surveys of carnivores + spring/fall beaver surveys; hair-snagging for mercury sampling; muskrat survey deferred to 2015.
10.12	Small Mammals	Study deferred to 2015.
10.13	**Bats**	Year 2 of acoustic detector survey; add telemetry to locate roosts and complete study.
10.14	**Eagles/Other Raptors**	Nest occupancy/productivity surveys (other tasks deferred to 2015).
10.15	**Waterbirds**	Aerial surveys (migration, breeding, broods); no radar/visual sampling.
10.16	**Landbirds/Shorebirds**	Year 2 of point counts + riparian/lacustrine surveys; no swallow survey.
10.17	**Willow Ptarmigan**	Capture/radio-tracking + aerial transect surveys continuing.
10.18	**Wood Frog**	Year 2 of auditory surveys + acoustic monitoring to complete study.
10.19	Wildlife Habitat Evaluation	Study deferred to 2015.
10.20	Wildlife Harvest Analysis	Study deferred to 2015.

Study 10.14 – Eagles & Other Raptors



Study 10.14 — Plans for 2014

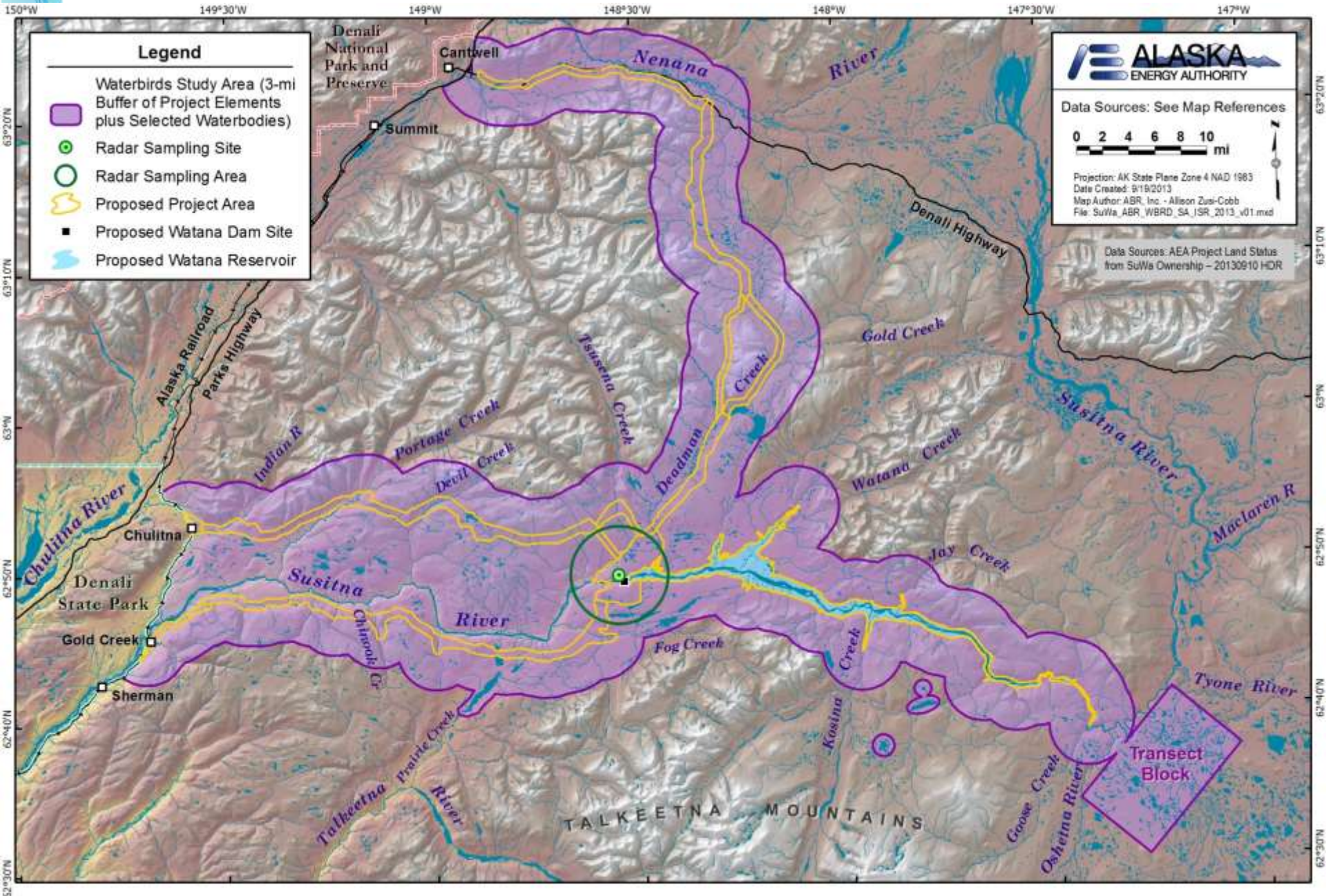
No modification of RSP Methods proposed:

- Nest Occupancy & Productivity (Aerial Surveys):
  - Two occupancy surveys (late April to late May), plus two productivity surveys (mid-June to late July), including nest sightability assessment.
- Eagle Tissue Sampling for Mercury Assessment:
  - ABR must be designated as a subpermittee under a USFWS eagle salvage permit for collection of feathers (and any other suitable specimens, such as unhatched eggs or dead juveniles) for mercury analysis in 2014.

Schedule modifications (tasks deferred until 2015):

- Migration Surveys (mid-Apr. to mid-May, mid-Sep. to mid-Oct.)
- Woodland Raptor Nest Survey
- Nesting Habitat Delineation
- Bald Eagle Foraging and Roosting Surveys (Oct.–Dec.)

Study 10.15 – Waterbirds



Study 10.15 — Plans for 2014

- Aerial Surveys (Spring and Fall Migration):
  - Helicopter surveys of spring and fall migration, conducted at 5-day intervals between successive surveys during late April–late May/early June and mid-August–mid-October.
- Aerial Surveys (Breeding Season):
  - 2 breeding population surveys in June, including lake-to-lake surveys and transects in different portions of the study area.
  - 2 stream surveys of Harlequin Ducks during prenesting (late May–early June) and brood-rearing (late July–early August).
  - 2 or 3 surveys of waterbird broods (mid-July–early August) within 1 mile of proposed Project infrastructure.
- Tissue Sampling for Mercury Assessment:
  - Alternative methods for obtaining tissue samples of piscivorous waterbirds may be developed through consultation with USFWS and ADFG.
- Ground-based Radar & Visual Surveys of Migration (All Species):
  - *Decision Point in Study Plan*: Need for continuation to be decided through further consultation, based on 2013 results (ISR Sections 5.1.2 and 6.1.2).

Study 10.15 — Waterbirds (Radar/Visual Migration Surveys)

- 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.
- Observations were conducted at the camp site 24 hours per day throughout a 45-day period in the spring (20 April–3 June) and a 61-day period in the fall (16 August–15 October).
- Both radar and visual surveys were conducted from fixed locations.
- A portable marine radar, powered by a portable generator, was 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 (3.7 miles) of the site.
- During early portions of the night, an observer also used binoculars and night-vision equipment to record the relative numbers of different species flying through the area.
- During diurnal periods, visual observers recorded numbers, flight characteristics, and behaviors of all birds observed within 10 km (6.2 miles) of the site.

Study 10.15: Radar/Visual Migration Surveys

148°45'W 148°40'W 148°35'W 148°30'W

62°53'N 62°52'N 62°51'N 62°50'N 62°49'N 62°48'N 62°47'N

Legend

- Radar Sampling Site
- 1.5-km (0.9-mi) Radar Sampling Area
- 6-km (3.7-mi) Radar Sampling Area
- Proposed Project Area
- Proposed Watana Dam Site
- Proposed Watana Reservoir
- 20-m (66-ft) Elevation Contour

No ground sampling was conducted on Cook Inlet Region Village Corporation lands

Creek

Deadman Creek

Tsusena

Susitna River

Fog Lakes

Fog Creek

Radar/Visual Migration Survey Effort

- Spring:
  - April 20 – June 3
  - Diurnal visual surveys: 651 hours over 45 days
  - Diurnal radar: 88 hours over 43 days
  - Nocturnal radar: 184 hours over 42 nights
  - Nocturnal audio-visual surveys: 81 hours over 43 nights

- Fall:
  - August 16 – October 3
  - Diurnal visual surveys: 652 hours over 61 days
  - Diurnal radar: 94 hours over 54 days
  - Nocturnal radar: 367 hours over 59 nights
  - Nocturnal audio-visual surveys: 94 hours over 50 nights

Radar Survey Results

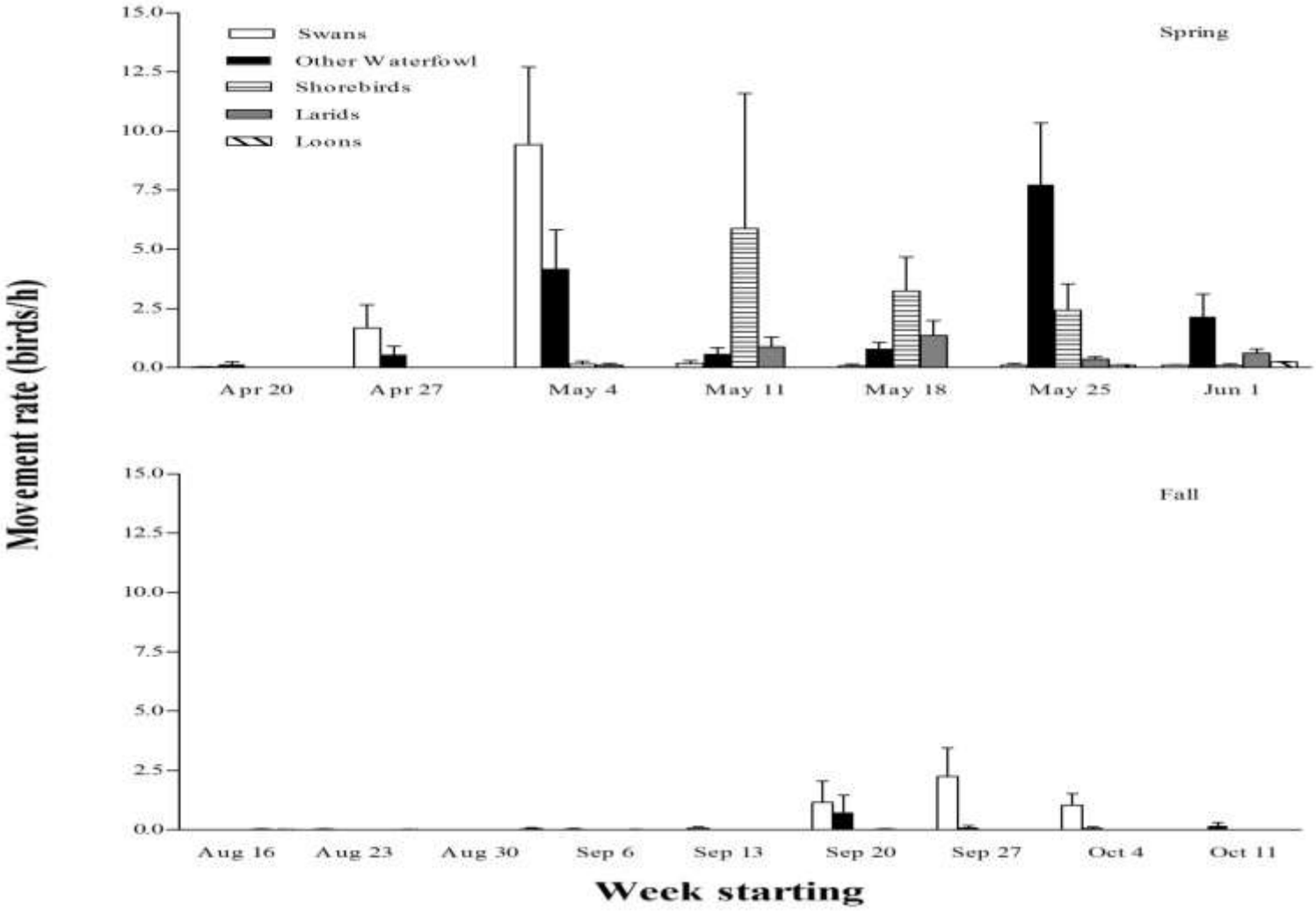
	Nocturnal	Diurnal
Spring		
Mean passage rate (targets/km/h)	114	31
Peak date (mean rate)	May 16 (380)	May 21 (287)
Mean flight direction	268°	255°
Mean flight altitude (m agl)	451	350
Fall		
Mean passage rate (targets/km/h)	119	11
Peak date (mean rate)	August 23 (771)	August 18 (52)
Mean flight direction	88°	42°
Mean flight altitude (m agl)	403	240

Ground-based Visual Survey Results

- Spring:
  - 89 species; 8,188 birds in 2,366 flocks
    - 40% passerines, 32% waterfowl, 14% shorebirds, 6% raptors
  - Mean daily rate: 11.3 birds/h (range 0.4 – 81.8)
  - Total observed (individuals/flocks):
    - Swans: 1,086/72
    - Other waterfowl: 1,572/157
    - Eagles: 215/197
    - Cranes: 23/12

- Fall:
  - 52 species; 6,445 birds in 1,234 flocks
    - 59% passerines, 27% Sandhill Cranes, 6% waterfowl, 3% raptors
  - Mean daily rate: 9.4 birds/h (range 0.6 – 150.3)
  - Total observed (individuals/flocks):
    - Swans: 301/30
    - Other waterfowl: 71/7
    - Eagles: 52/47
    - Cranes: 1,754/33

Ground-based Visual Survey Results - Waterbirds



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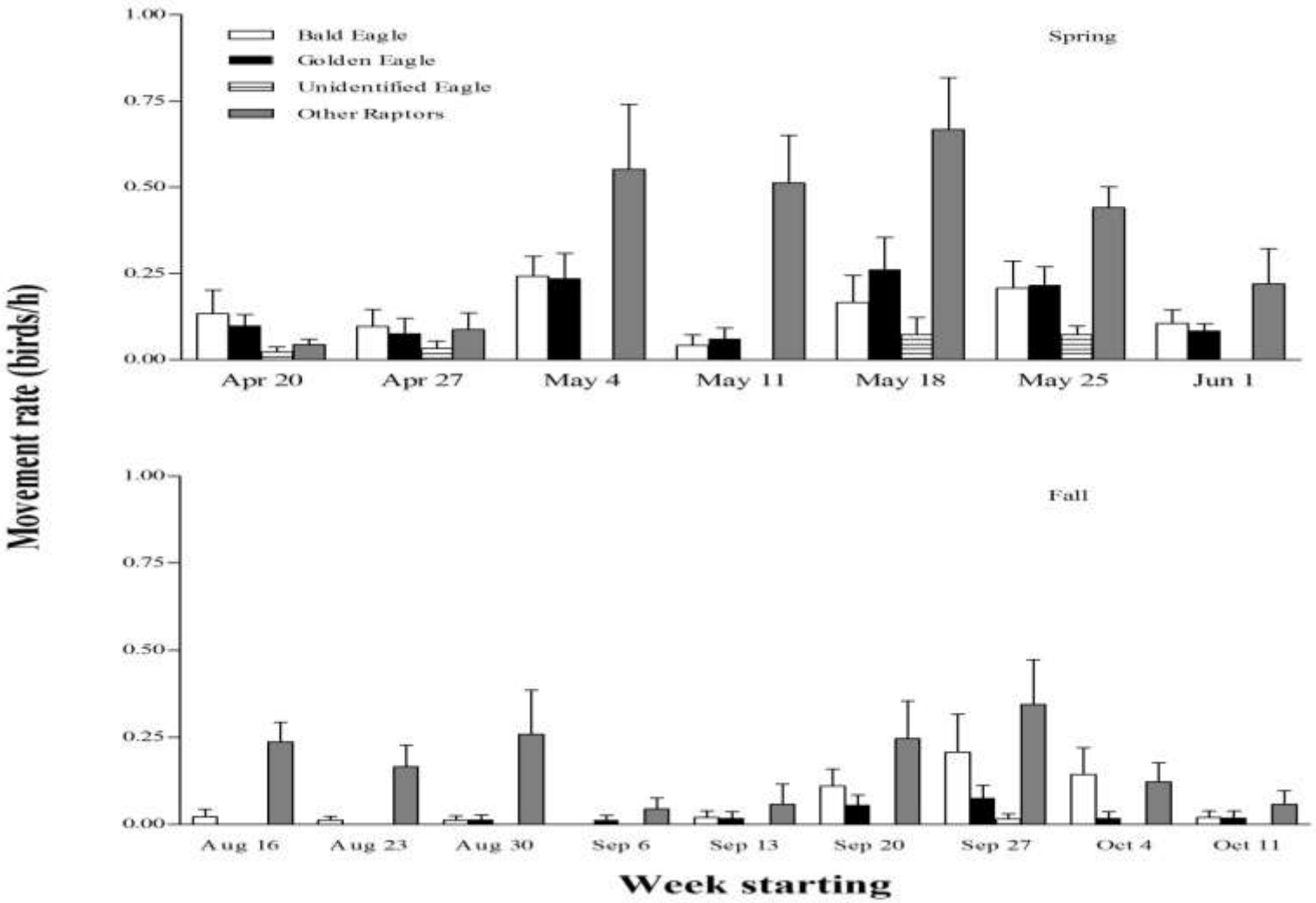
Ground-based Visual Survey Results - Raptors



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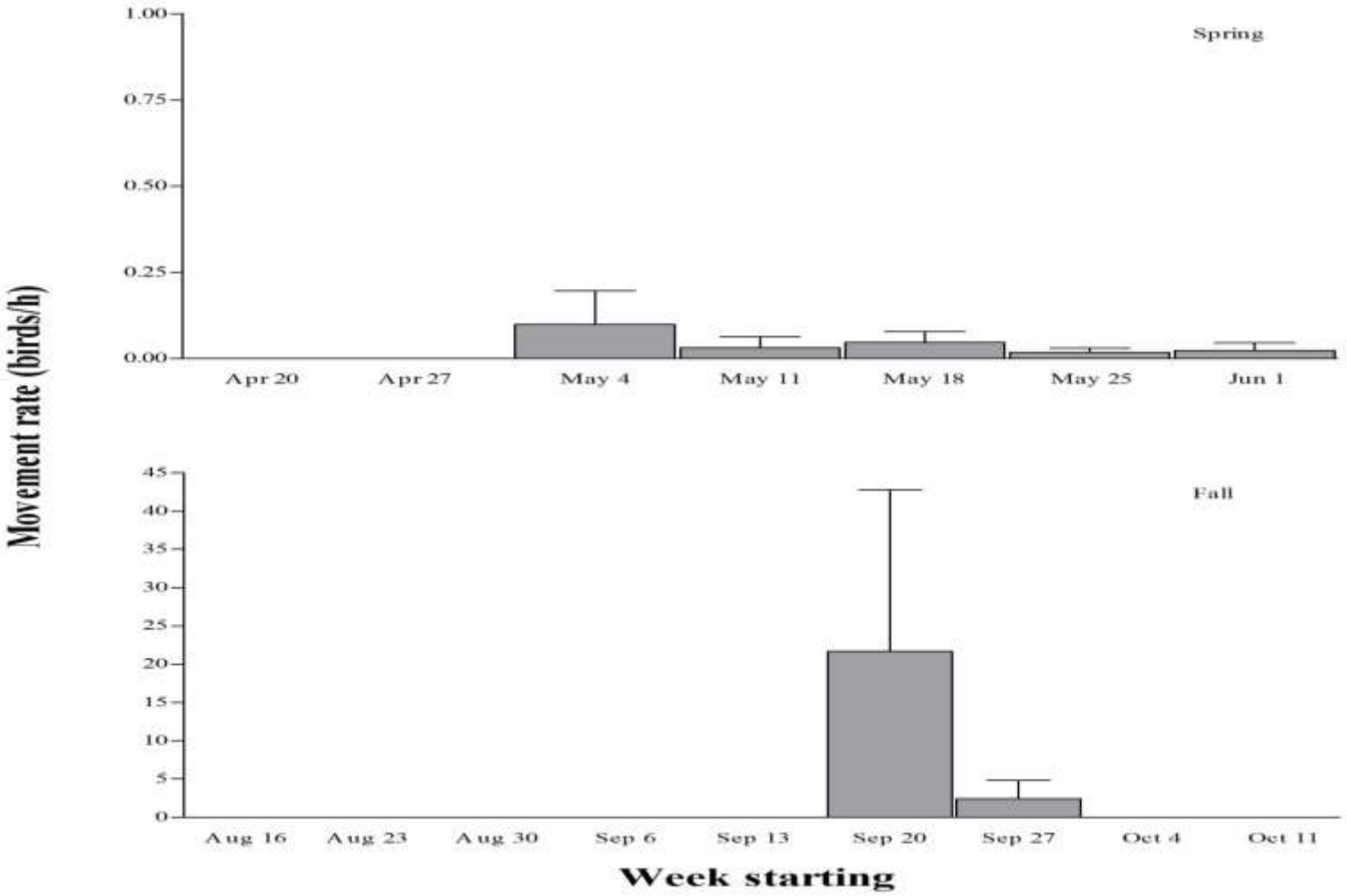
Ground-based Visual Survey Results - Cranes



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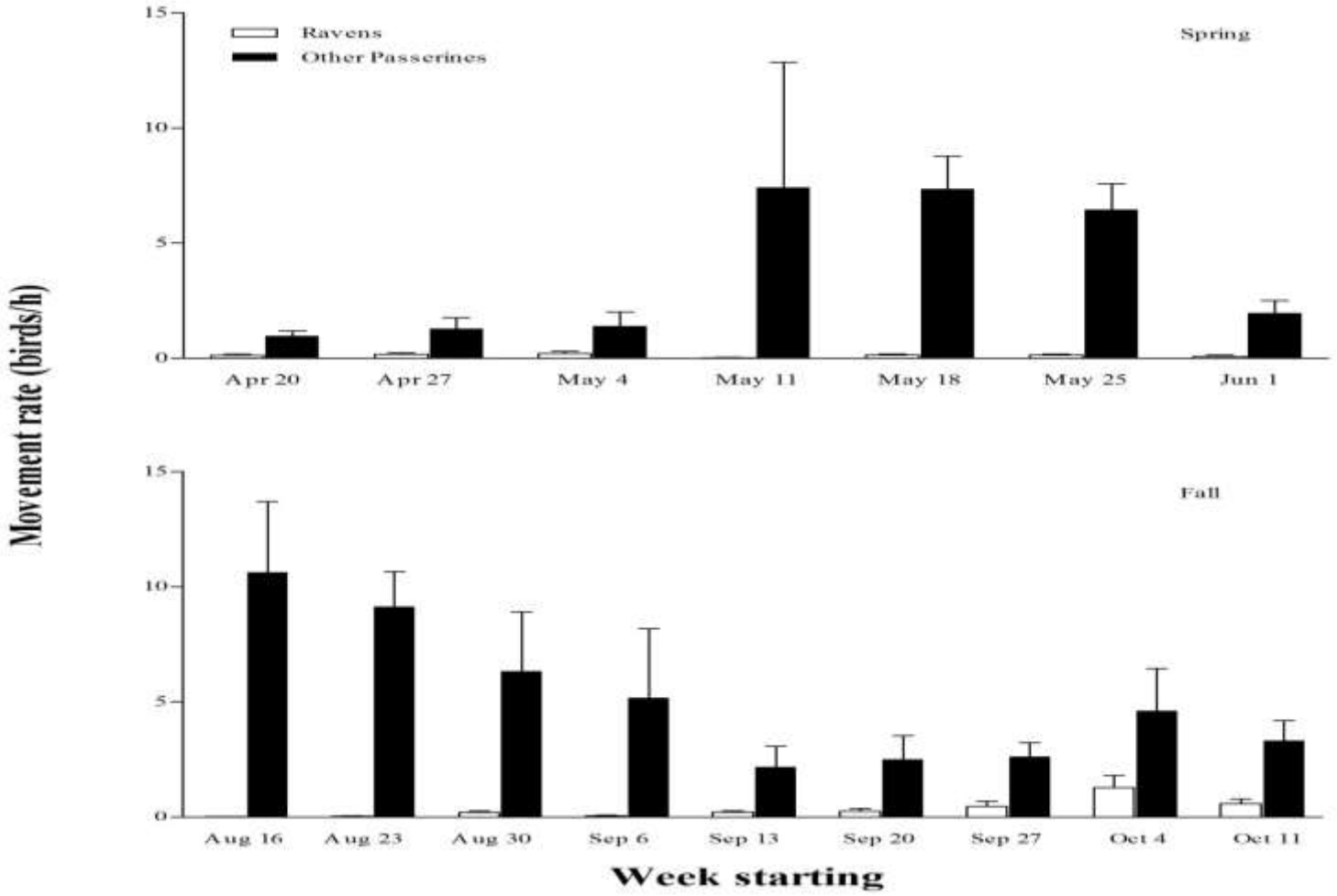
Ground-based Visual Survey Results - Passerines



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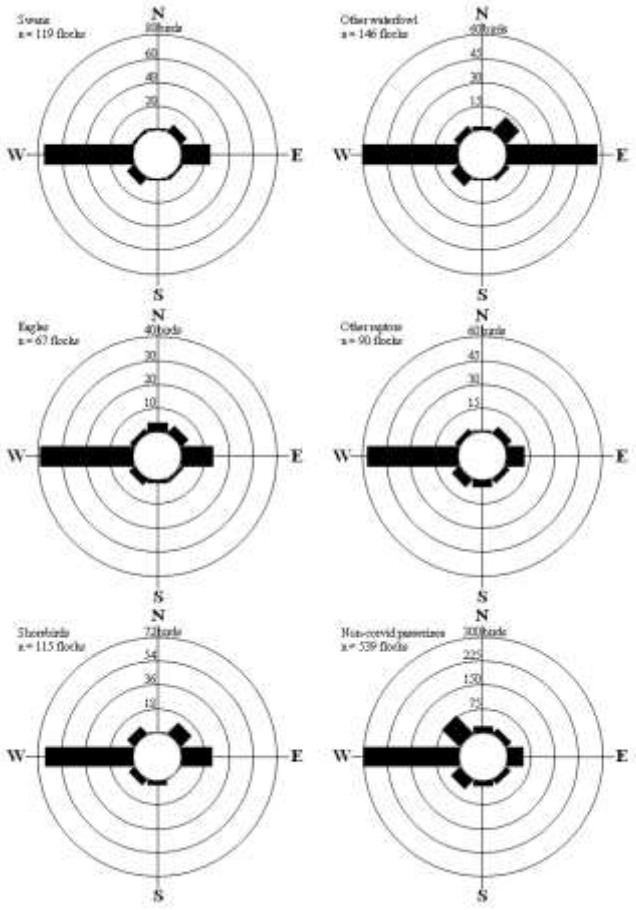
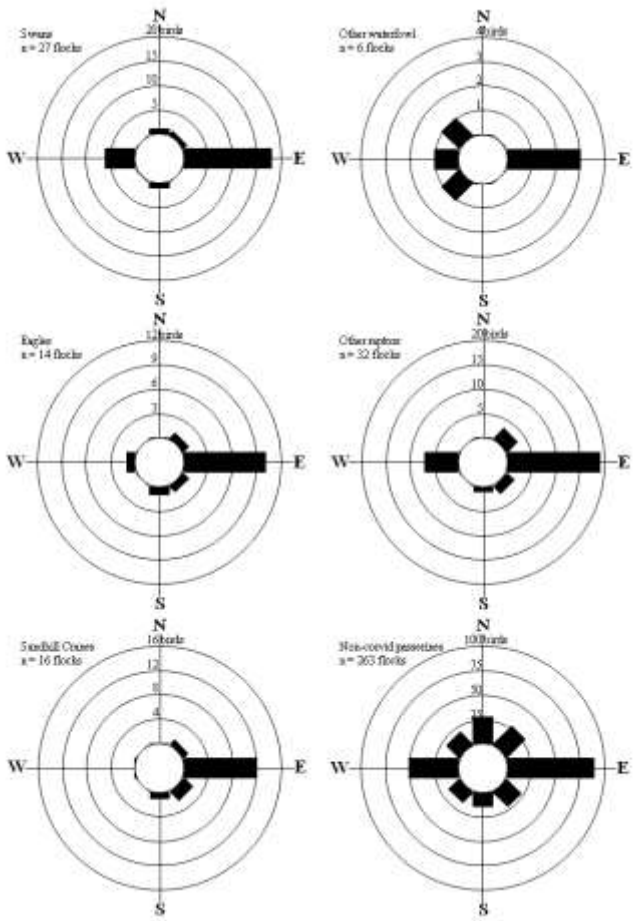
Ground-based Visual Survey Results – Flight directions

Spring



Fall



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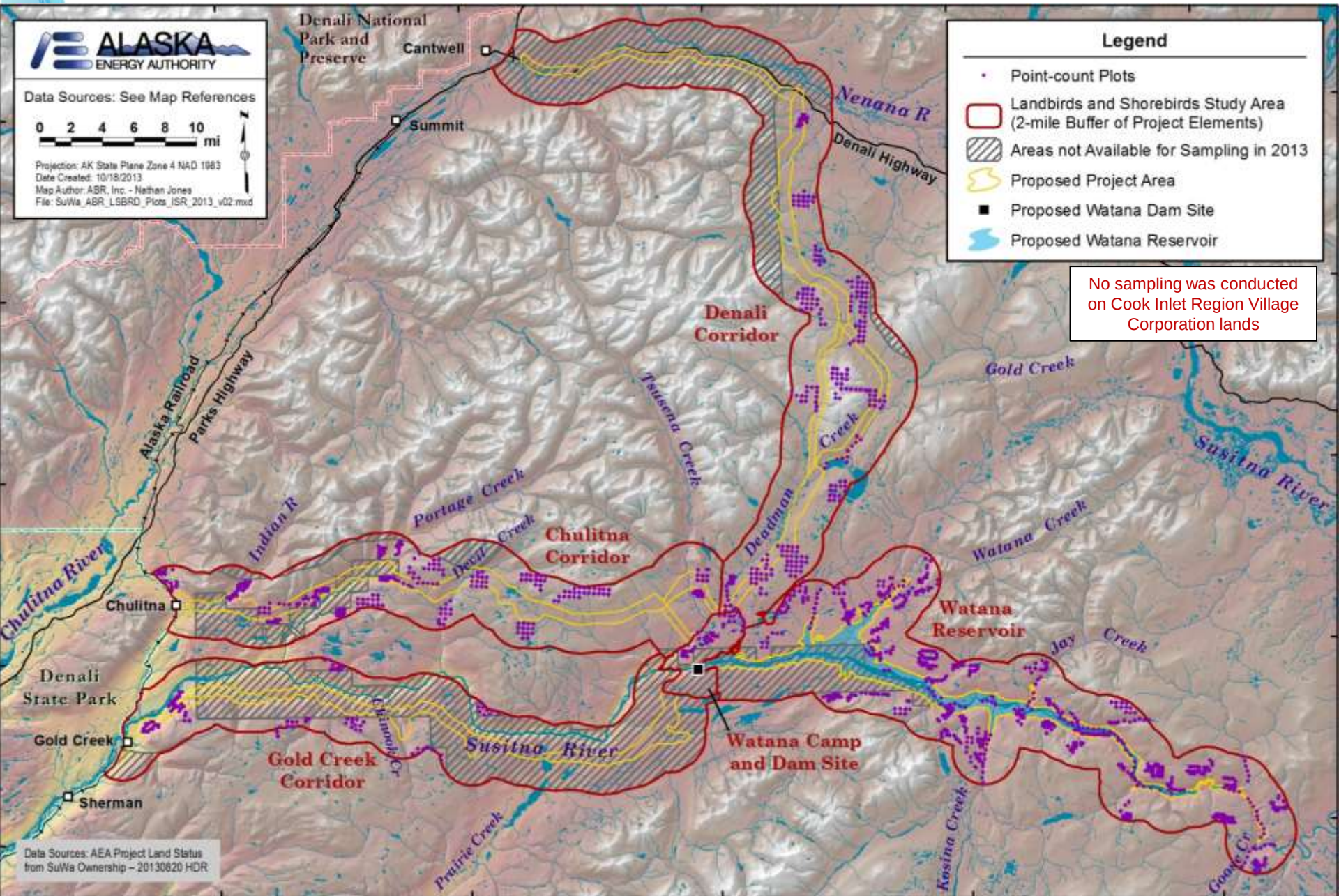
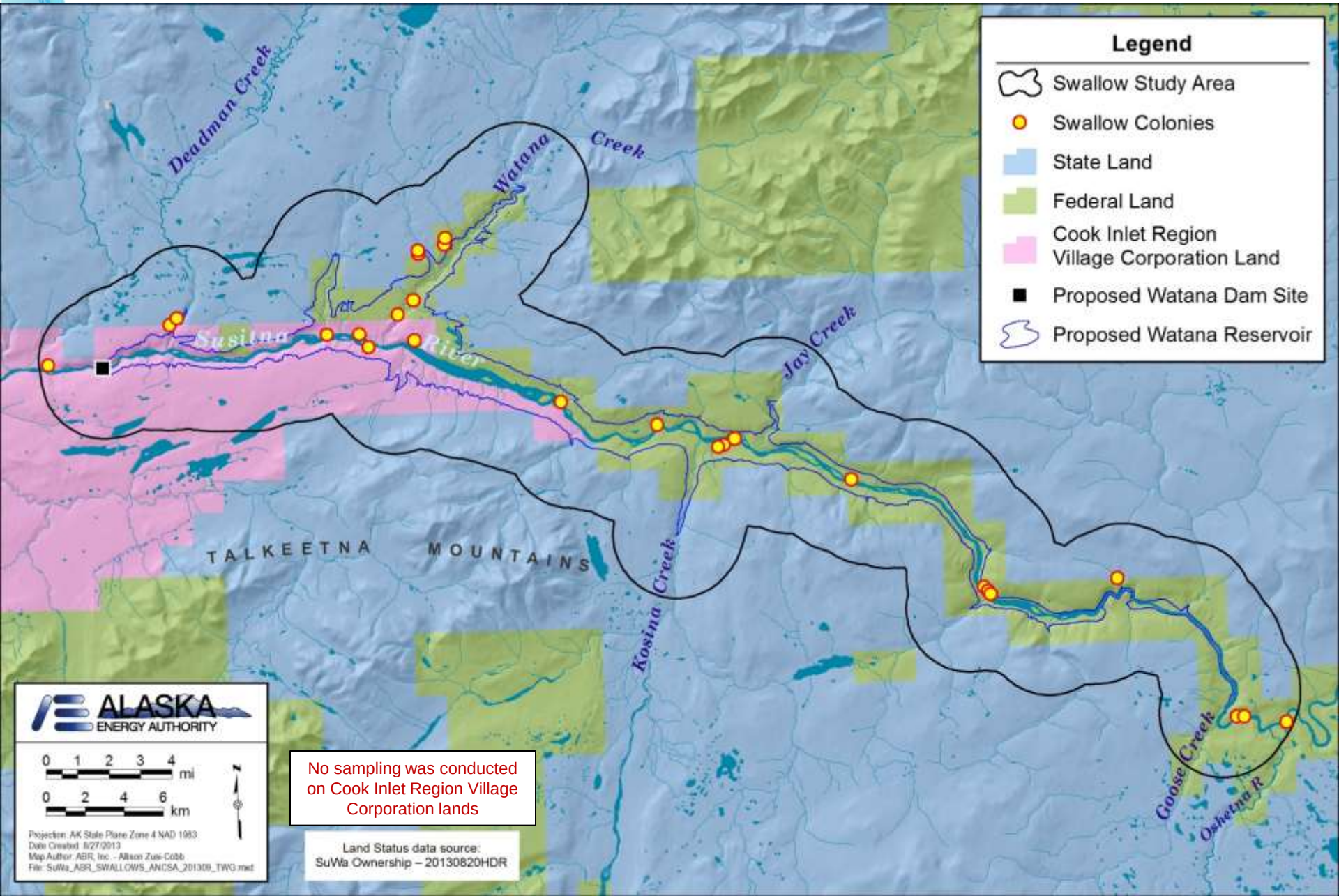
Radar/Visual Migration Survey Conclusions

1) Most comprehensive migration surveys in the upper Susitna River Basin.
2) Radar results indicated moderate numbers of nocturnal migrants flying in predicted, seasonally appropriate directions during both spring and fall.
3) Spring migration rates of waterfowl and cranes were lower than those recorded elsewhere in central Alaska.
4) Fall numbers for all non-passerines except cranes were lower than spring numbers and were lower (including cranes) than reported elsewhere in the region.
5) Spring shorebirds were the only group with high numbers of individuals observed relative to most other studies.
6) Swans were undercounted to some extent during the spring survey because of low visibility during the day with the highest number of (audio) detections for the season.
7) Arrival dates of spring migrants to the study area in 2013 were likely much later than in most other years, due to the extension of winter weather into May, but it is unclear to what extent it may have affected migratory pathways and passage rates.
8) Survey periods likely encompassed the vast majority of migration for most species groups, although waterbodies remained open through the end of the survey period; so some swan migration may have occurred after sampling ended in fall.
9) Radar and visual surveys confirmed that flight directions of most species groups were strongly oriented in expected directions for each season, except for easterly movements of scoter flocks in late May.
10) Nocturnal radar results matched seasonal timing of diurnal radar passage rates and visual movement rates of passerines.

Study 10.16 – Landbirds & Shorebirds, 2013



Study 10.16 – Swallow Colony Locations, 2013



Study 10.16 — Plans for 2014

- Point-count and Riverine/Lacustrine Transect Surveys:
  - Repeat intensive sampling mid-May to mid-June, including point counts in all available habitats plus riverine- and lacustrine-focused surveys; CIRWG lands will be surveyed in 2014, if permitted.
- Tissue Sampling for Mercury Assessment:
  - Consider alternative approaches for collecting tissue samples from Belted Kingfishers, in consultation with USFWS and ADFG.

Schedule modifications (deferred until 2015):

- Estimation of Breeding Population Density & Abundance:
  - Use combined 2013–2014 point-count data, corrected for detectability, to determine densities and total estimated birds occurring in various subdivisions (e.g., buffers of each of the proposed Project components) in the study area.
- Habitat-use Analyses:
  - Conduct habitat-use analyses, based on the final mapped wildlife habitat types, to facilitate work on the Evaluation of Wildlife Habitat Use (RSP 10.19).
- Swallow Colony Survey:
  - Need for continuation of this survey task to be decided through consultation with USFWS and ADFG (2013 survey covered all portions of the reservoir survey area).

—Break —

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

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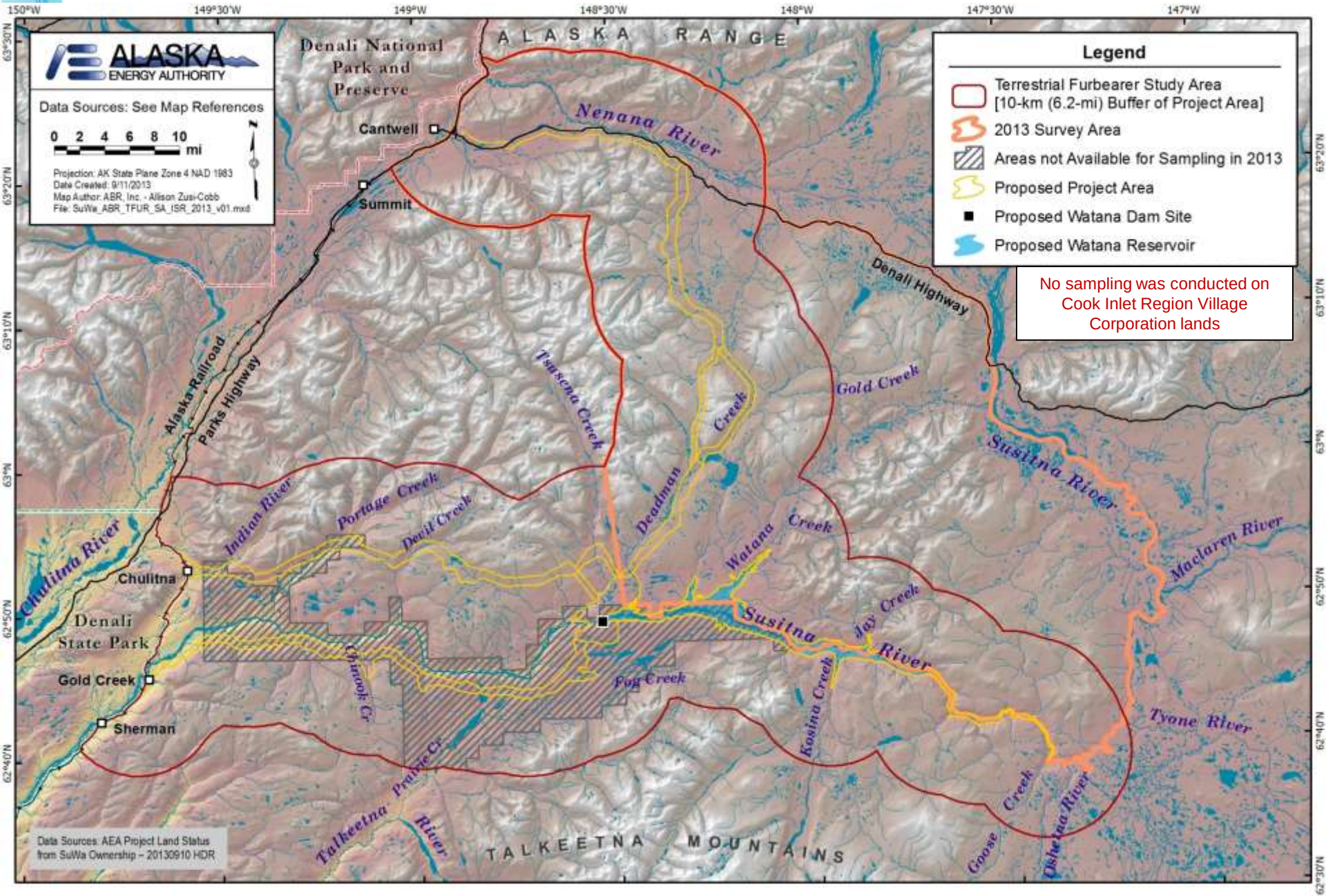
Study 10.10 – Terrestrial Furbearers



Study Plan Variances for Terrestrial Furbearers (Hair & Scat Sampling)

- Hair and Scat Sample Collection:
  - 2013 survey area was smaller than planned due to the lack of a suitable base of winter operations in the middle of the study area, the difficulty of reaching and crossing the Susitna River by snowmachine, and the lack of access to CIRWG lands in the western portion of the reservoir zone and the Gold Creek and Chulitna corridors.
  - Deployment of lynx hair-snag stations was modified to more closely match the sampling approach used for canid scats, thereby increasing sampling efficiency while still maintaining a similar sampling density.
  - Collection of marten hair samples could not be accomplished as planned in 2013 due to the difficulty or inability to access suitable habitat (spruce forest) in and near the reservoir inundation zone.

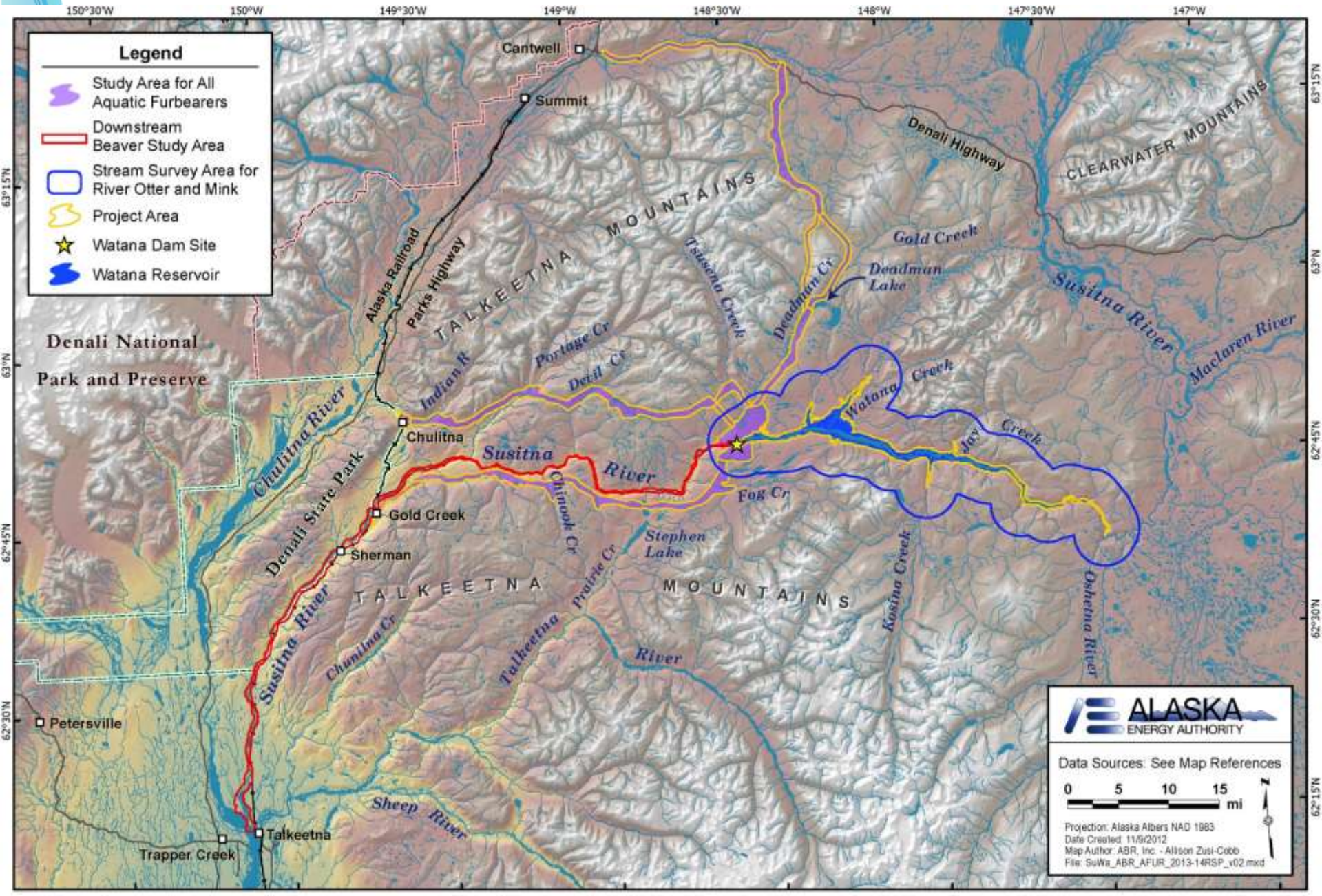
Study Plan Variances for Terrestrial Furbearers (Prey Population Indices)

- 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 compared with 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.

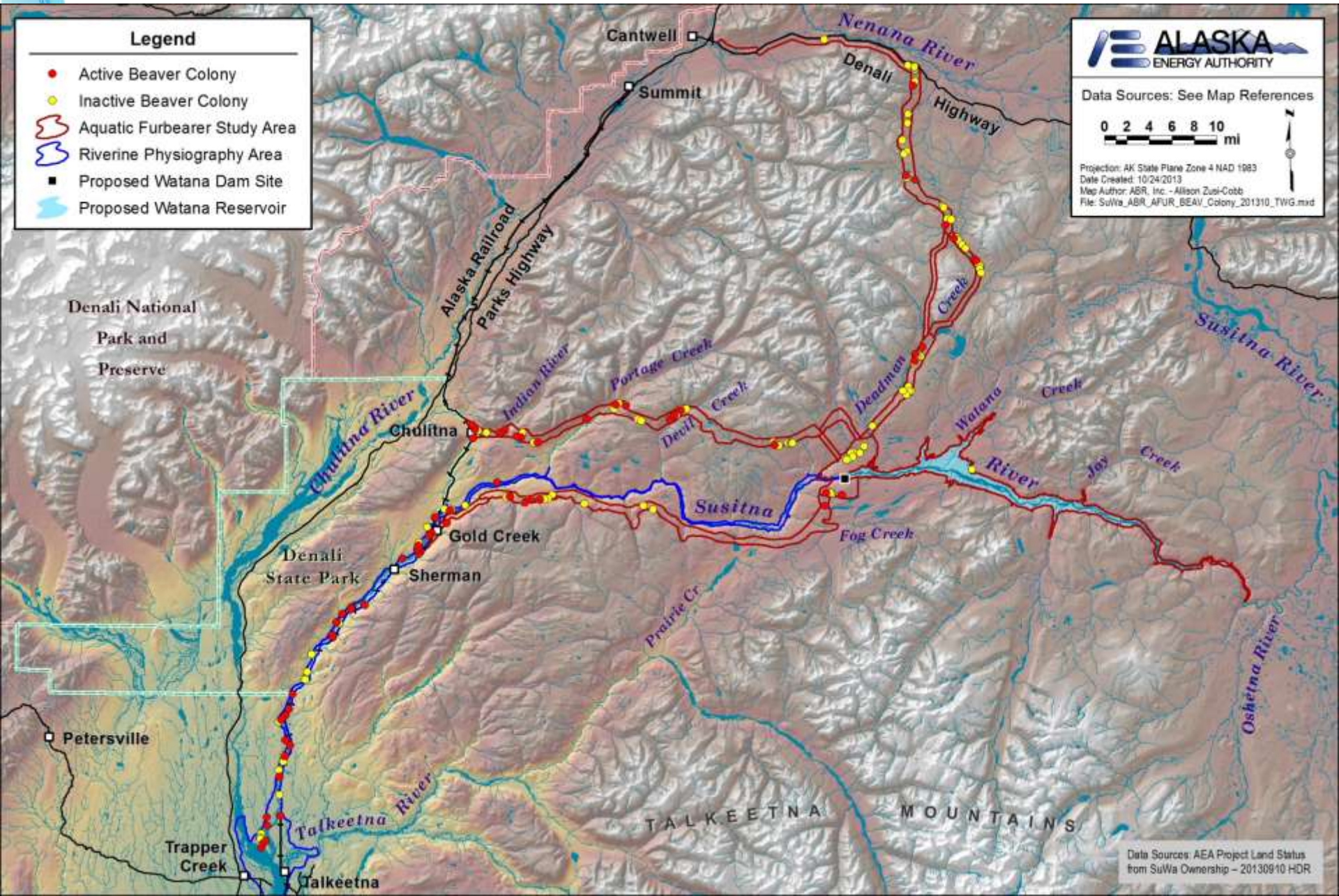
Study 10.10 — Plans for 2014

- Hair & Scat Collection:
  - Samples are being collected during field sampling using snowmachine access in as much of the study area as can be reached safely with landowner permission; a cabin is being used for better access in central and southern portions of study area.
  - Field work being conducted daily during January–March 2014, possibly extending into April, depending on conditions.
  - Analysis of genetic samples and habitat occupancy data will be conducted during summer and fall for inclusion in the Updated Study Report (USR).
- Aerial Surveys of Tracks:
  - Three aerial surveys will be conducted (ideally, once monthly during January–March) within 3–5 days after fresh snowfall, using the same transects sampled in 1980 and 2013.
- Snowshoe Hare and Vole Population Indices:
  - Established sampling grids for hare pellets and live-trapping of voles to be resampled in summer to assess prey population trends.

Study 10.11 – Aquatic Furbearers



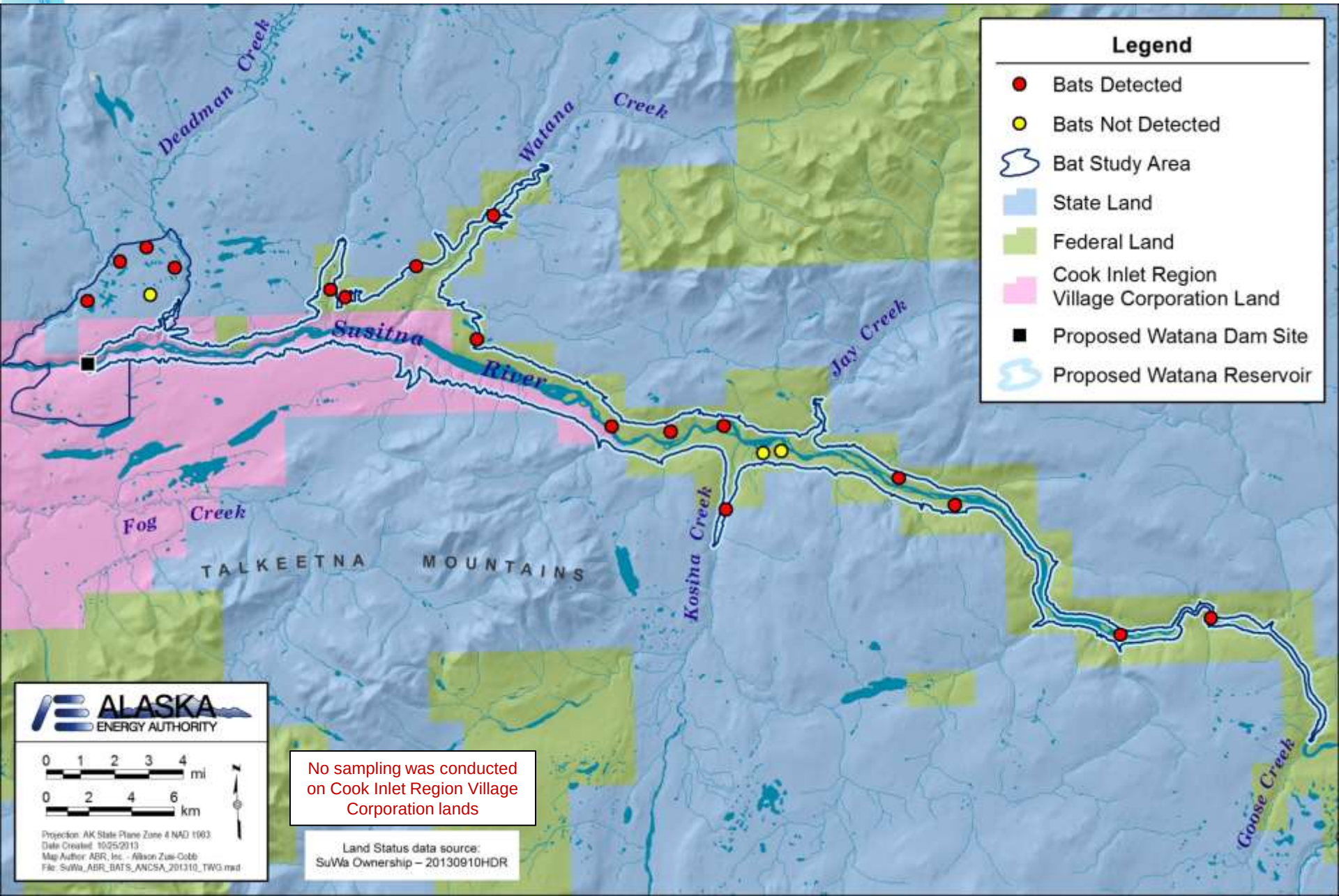
Study 10.11 – Beaver Colony Survey, 2013



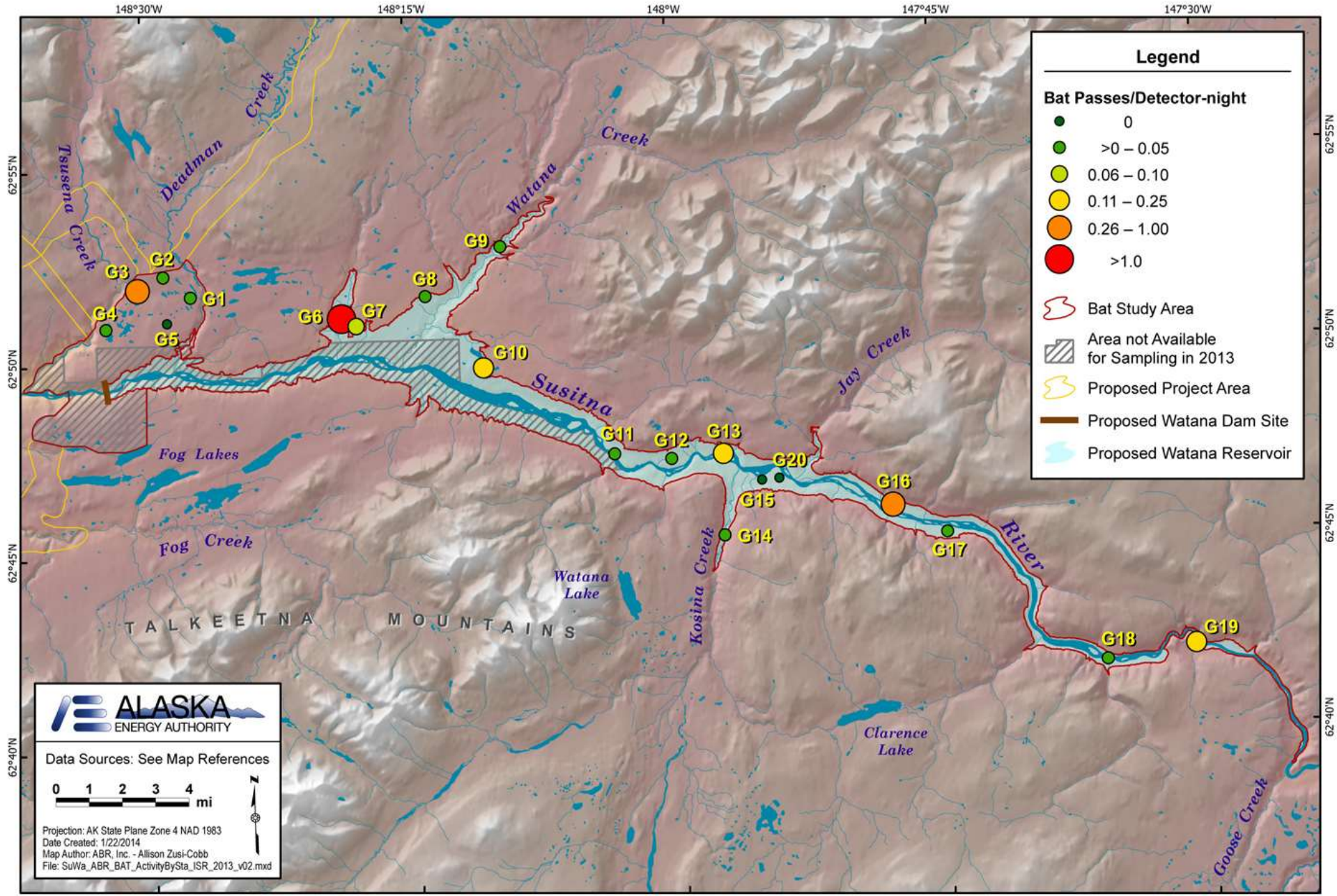
Study 10.11 — Plans for 2014

- River Otter & Mink:
  - Two or three aerial surveys of tracks will be flown within 3 days after fresh snowfall during February–early April and once in November or December.
- Hair Sampling for Mercury Assessment:
  - Hair snagging will be attempted in winter 2014 at locations where river otters are seen on aerial surveys in the reservoir survey area. If usable samples are not obtained in 2014, an experienced trapper will be sought for a dedicated trapping effort in the study area in winter 2014–2015.
- Beaver:
  - Spring survey (April/May) to assess overwinter survival of active colonies identified in October 2013.
  - Fall survey (late September/early October) to enumerate active colonies throughout study area.
- Muskrat:
  - Muskrat survey will be deferred until spring 2015 (April or May, depending on conditions).

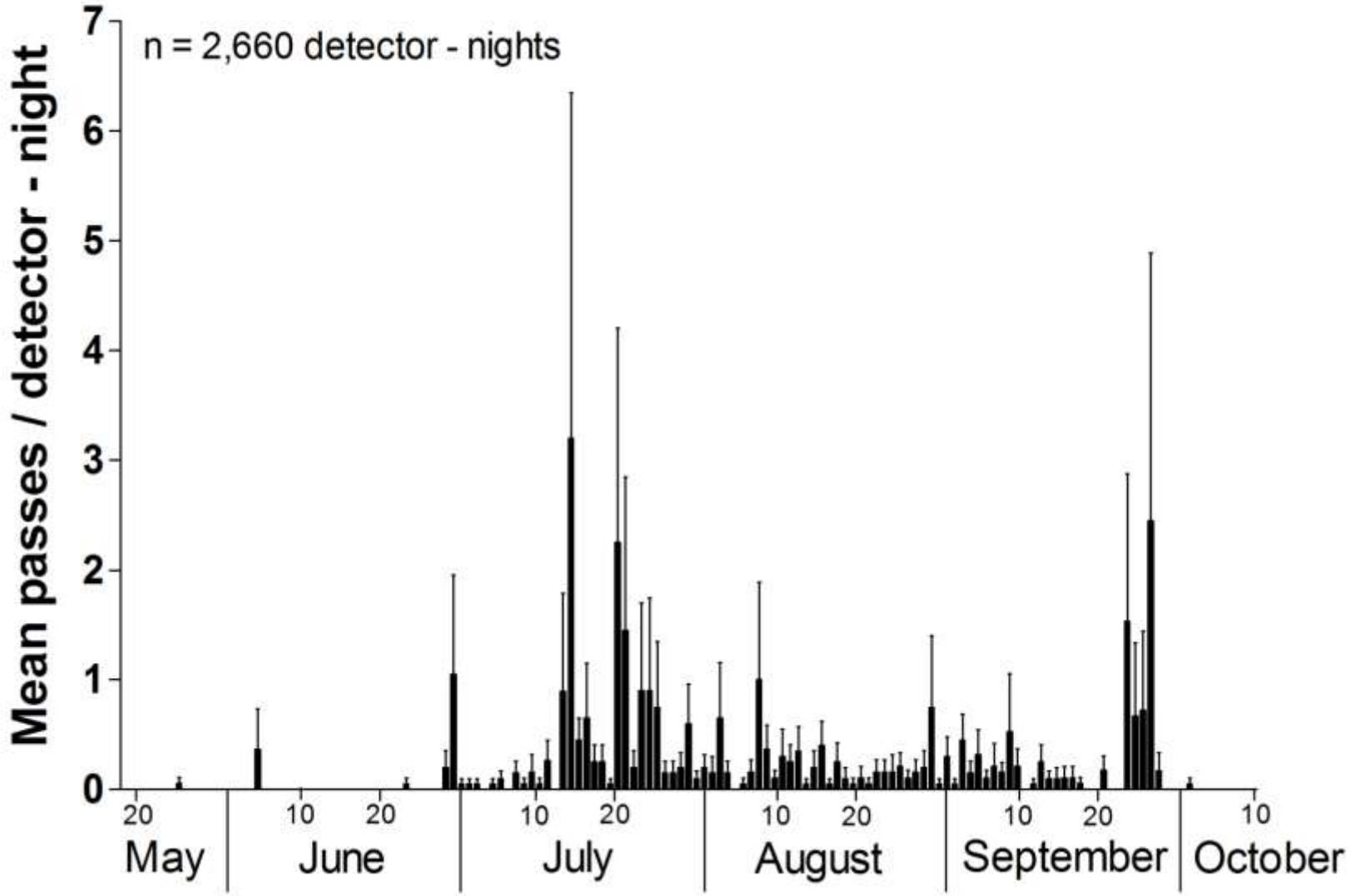
Study 10.13 – Bats



Study 10.13 – Bats



Study 10.13 – Bats



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Study 10.13 — Plans for 2014

- *Decision Point from Study Plan*: Conduct a second season of study if roosts were located in 2013. Although no roosts were found, a second season of study is warranted by the high proportion of acoustic detections (85% of monitoring sites, higher than anticipated) in 2013. Cliff habitats are suspected to be the most likely roost locations in the study area.
- *Adjust sampling plan based on 2013 results:*

➢ Acoustic Monitoring:

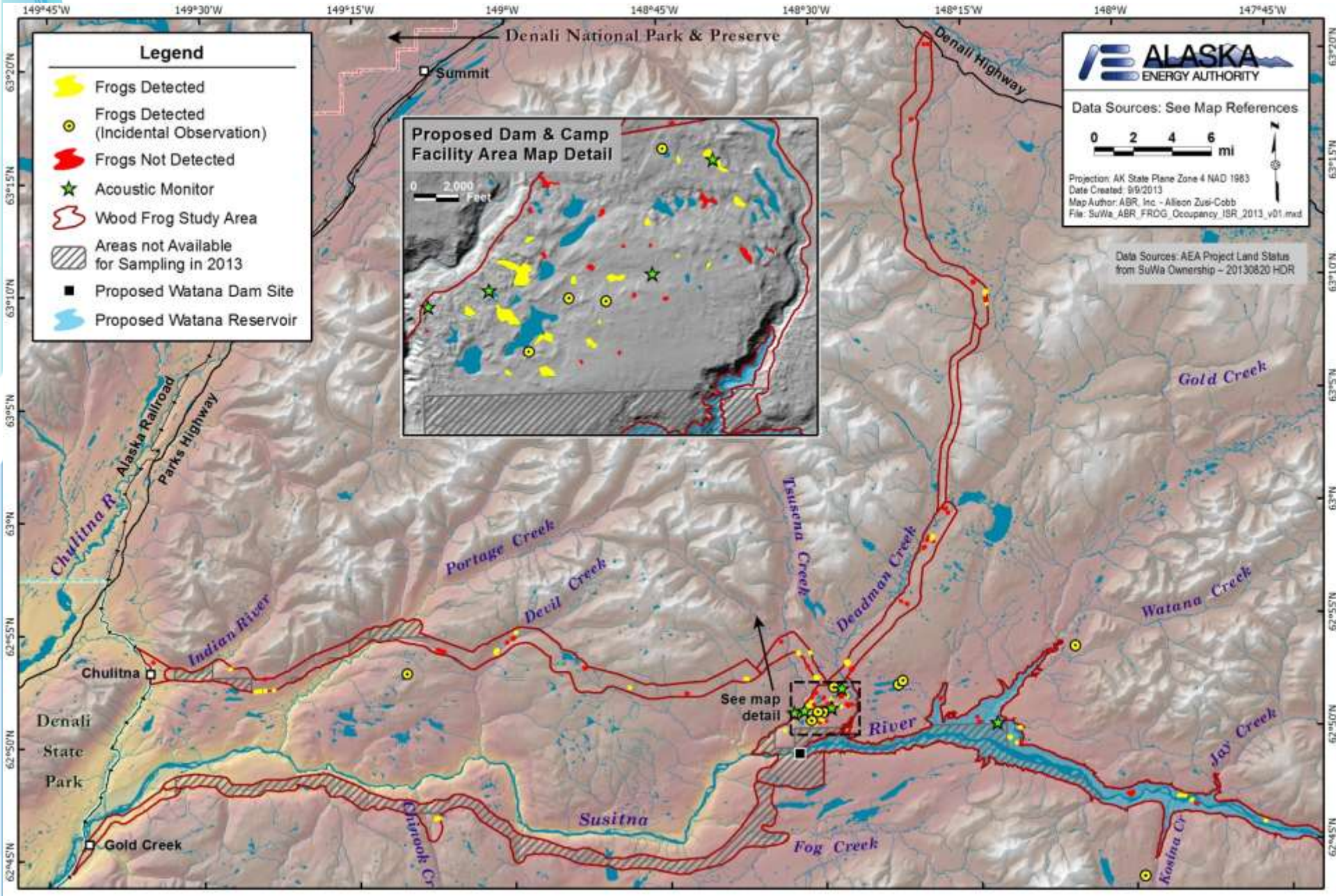
  – Deploy a smaller number of bat detectors in the study area from May to October, targeting areas with highest numbers of bat detections in 2013 and, if accessible, where sampling could not be conducted in 2013.

➢ Radio Telemetry to Locate Roosts:

  – Capture (using mist nests) and radio-tag bats in July and September to track back to roosts (range 2 miles, battery life 12 days).

  – Focus capture effort on locations within the likely foraging range of bats around detector stations where bat vocalizations have been recorded.

Study 10.18 – Wood Frogs, 2013



Study 10.18 — Plans for 2014

- Auditory Surveys:
  - Field surveys (involving up to 3 visits per site during the peak period of calling activity by breeding male frogs, expected in mid- to late May) will be conducted in areas inaccessible in 2013 (CIRWG lands, high-elevation sites).
  - Egg masses will be searched for opportunistically at sampling sites, in addition to listening for calling males.
- Acoustic Monitoring:
  - 5 acoustic monitors will be deployed at locations where frogs are detected on the first visit to better delineate the seasonal and diurnal timing of calling activity, for use in detectability assessment & occupancy modeling.
- Occupancy Modeling & Habitat Associations:
  - Detectability and habitat covariates will be incorporated into a habitat modeling analysis.
- Chytrid Fungus Sampling:
  - Discontinue this opportunistic effort due to the small number of samples obtained (7 in 2013) in relation to the sample size needed for firm conclusions regarding presence/absence.

Questions?

Wolf near Deadman Creek and the Denali access corridor, June 3, 2013.

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