

# SUSITNA-WATANA HYDROELECTRIC PROJECT

## Formal ILP Proposed Study Plan Review

August 9, 2012

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Environmental Research & Services



# Wildlife Resources: Proposed Studies, II

- Moose Distribution, Abundance, Movements, Productivity, and Survival
- Caribou Distribution, Abundance, Movements, and Productivity
- Distribution, Abundance, and Habitat Use of Large Carnivores
- Dall's Sheep Distribution, Abundance, and Habitat Use
- Wolverine Distribution and Abundance
- Terrestrial Furbearer Abundance and Habitat Use
- Aquatic Furbearer Abundance and Habitat Use
- Population Ecology of Willow Ptarmigan in Game Management Unit 13



# Objectives: Moose

- Describe moose population size and composition in study area
- Assess relative importance of habitats in impoundment zone, proposed transportation corridors, and downstream riparian area
- Document productivity and calf survival of moose in study area
- Document late-winter use of proposed reservoir impoundment zone
- Document moose browse use in and adjacent to impoundment zone and downstream riparian area
- Assess relative importance of habitats to moose in impoundment zone and proposed transportation corridors
- Document amount of habitat potentially available for improvement through crushing, prescribed burning, or other enhancement methods
- Analyze and synthesize data from historical and current telemetry and population studies of moose, continuing AEA 2012 study W-S1.



# Objectives: Caribou

- Document seasonal use of, and movement through, Project area by both females and males of the Nelchina caribou herd (NCH) and the Delta caribou herd (DCH)
- Assess relative importance of Project area for both the NCH and DCH
- Document productivity and calf survival of caribou using Project area
- Analyze data from historical caribou studies and synthesize with recent data for the NCH and DCH as a continuation of the caribou task of AEA 2012 study W-S1.



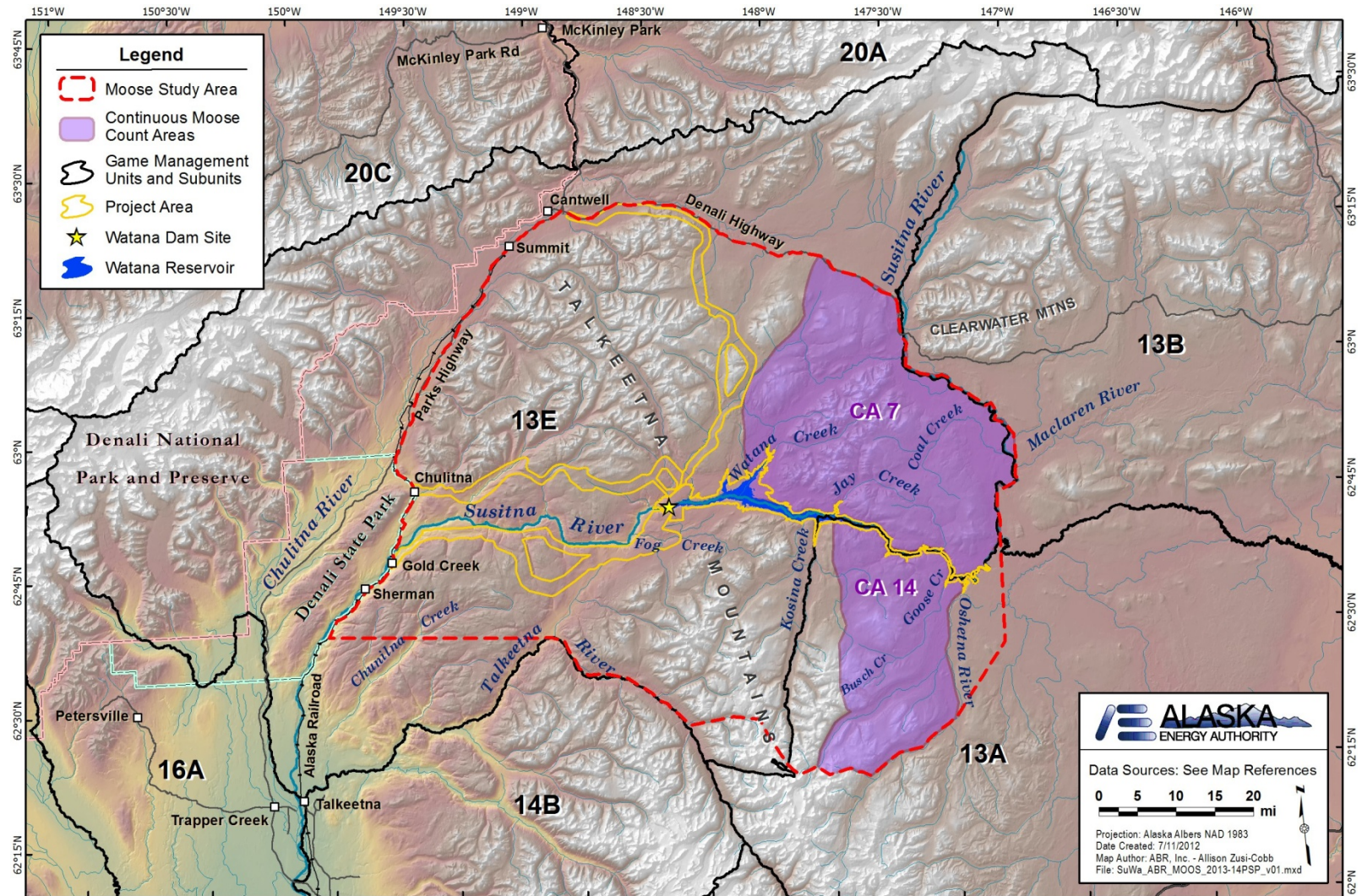


# Objectives: Large Carnivores

- Estimate current populations of brown bears, black bears, and wolves in Project area using existing data from ADF&G
- Assess bear use of streams supporting spawning by anadromous fishes downstream of the proposed dam that may potentially be altered by the Project, and estimate the number of bears using those habitats
- Describe seasonal distribution and habitat use of wolves in Project area, using existing data from ADF&G
- Synthesize historical and current data on bear movements and seasonal habitat use in Project area, including radio-tracking data from the 1980s, as a continuation of AEA 2012 study W-S1.



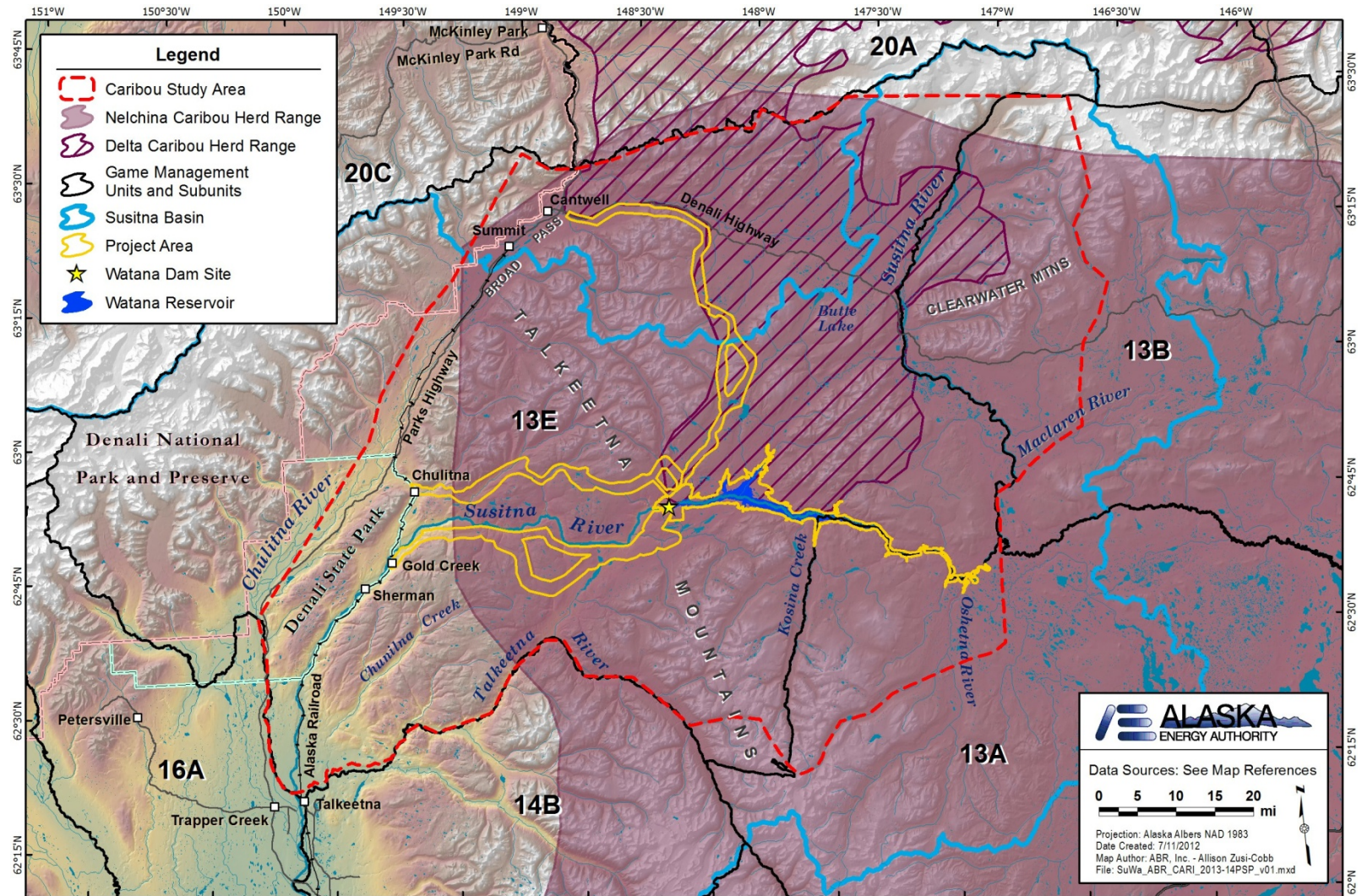
# Study Area: Moose



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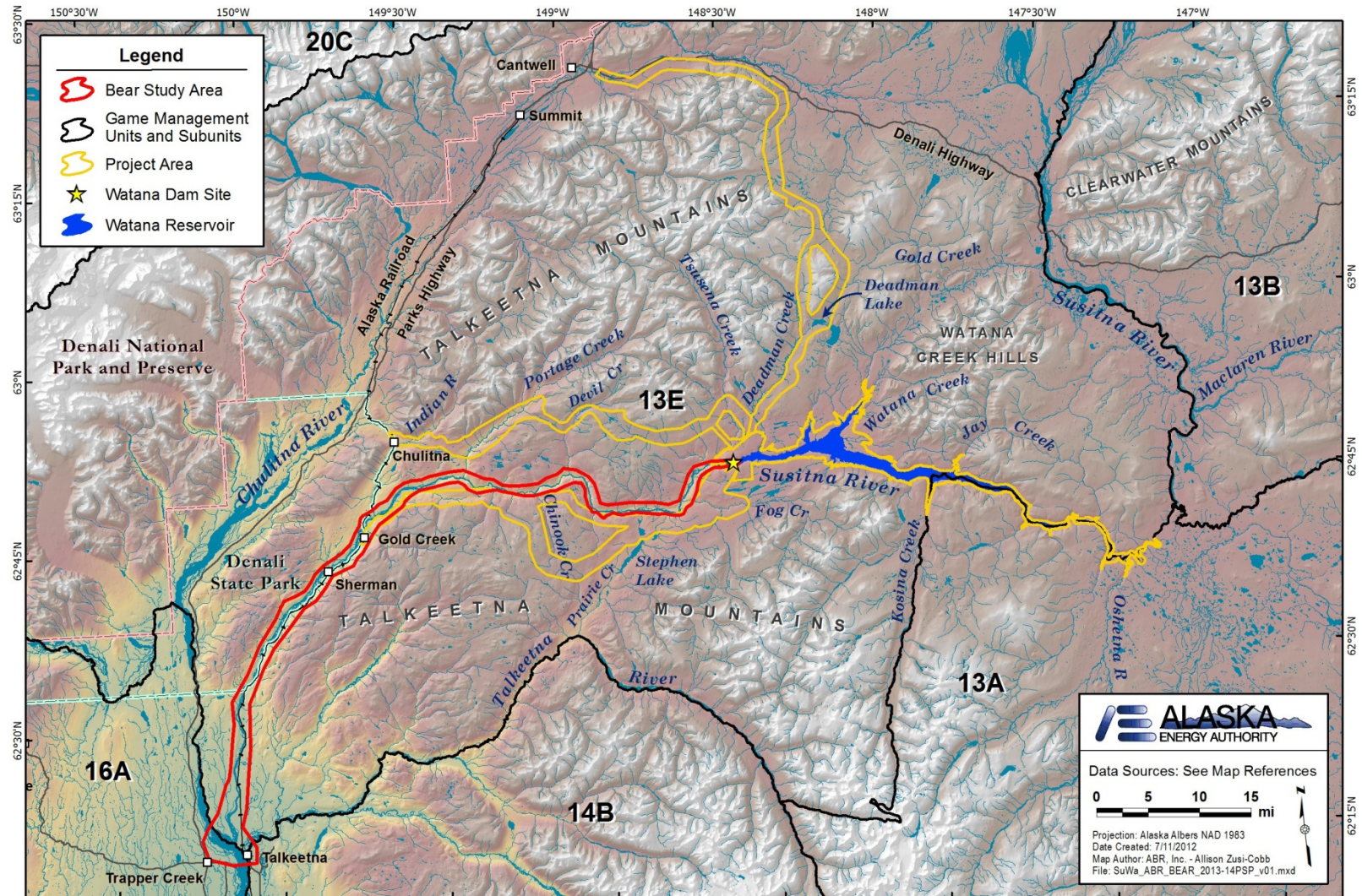
# Study Area: Caribou



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# Study Area: Large Carnivores



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# Methods: Moose and Caribou

- Monitoring of GPS/satellite and VHF radio collars for data on movements, productivity, and survival of moose and caribou
- Population monitoring of moose using aerial quadrat surveys and GeoSpatial Population Estimator (GSPE) methods
- Moose browse removal survey and habitat assessment
- Spatial analysis of historical and current telemetry data sets





# Methods: Large Carnivores

## Bears:

- Reanalysis of 1980s data and synthesis with current data from other ADF&G telemetry studies and other regional management studies
- Survey of bear use of fish-spawning streams downstream from dam, employing stream surveys and DNA and stable-isotope analyses of hair samples, in consultation with ADF&G biologists
- Evaluation of berry resources in reservoir zone during vegetation/wildlife habitat mapping survey

## Wolf:

- Review and synthesis of historical and current population data
- Spatial analysis of ADF&G telemetry datasets



## Expected Results: Moose, Caribou, Large Carnivores

- Annual and seasonal ranges of individual radio-collared animals
- Annual and seasonal ranges of caribou herds
- Estimates of productivity and survival from collared individuals
- Estimates of population size and density in region encompassing Project area, including specific estimates of numbers of moose using reservoir zone and bears using fish-spawning streams downstream
- Assessment of moose browse in Project area and berry abundance in reservoir zone
- Habitat association data from telemetry locations



# Summary of 2012 Activities: Moose, Caribou, Large Carnivores

- Late-winter population survey of moose using proposed reservoir impoundment zone.
- Acquisition and analysis of historical (APA Susitna Hydro Project) telemetry data from ADF&G for moose, caribou, bears; receipt of more recent data pending.
- October 2012 : ADF&G plans to deploy radio and GPS/satellite collars on moose and caribou and monitor at least monthly.
- Reanalysis and synthesis of existing bear and wolf data through 2011 underway; new data will be incorporated incrementally as they are obtained from ADF&G.



# Discussion: Moose, Caribou, Large Carnivores

- Moose and caribou study plans were developed by ADF&G and have incorporated their input.
- BLM comments on moose and caribou study plans may need to be addressed further; is a follow-up meeting needed among ADF&G, BLM, and AEA?
- Downstream sampling and estimation of bear populations downstream require further consultation with ADF&G with regard to study design (hair snags, DNA, stable isotopes).
- Other questions or concerns regarding these proposed study plans?



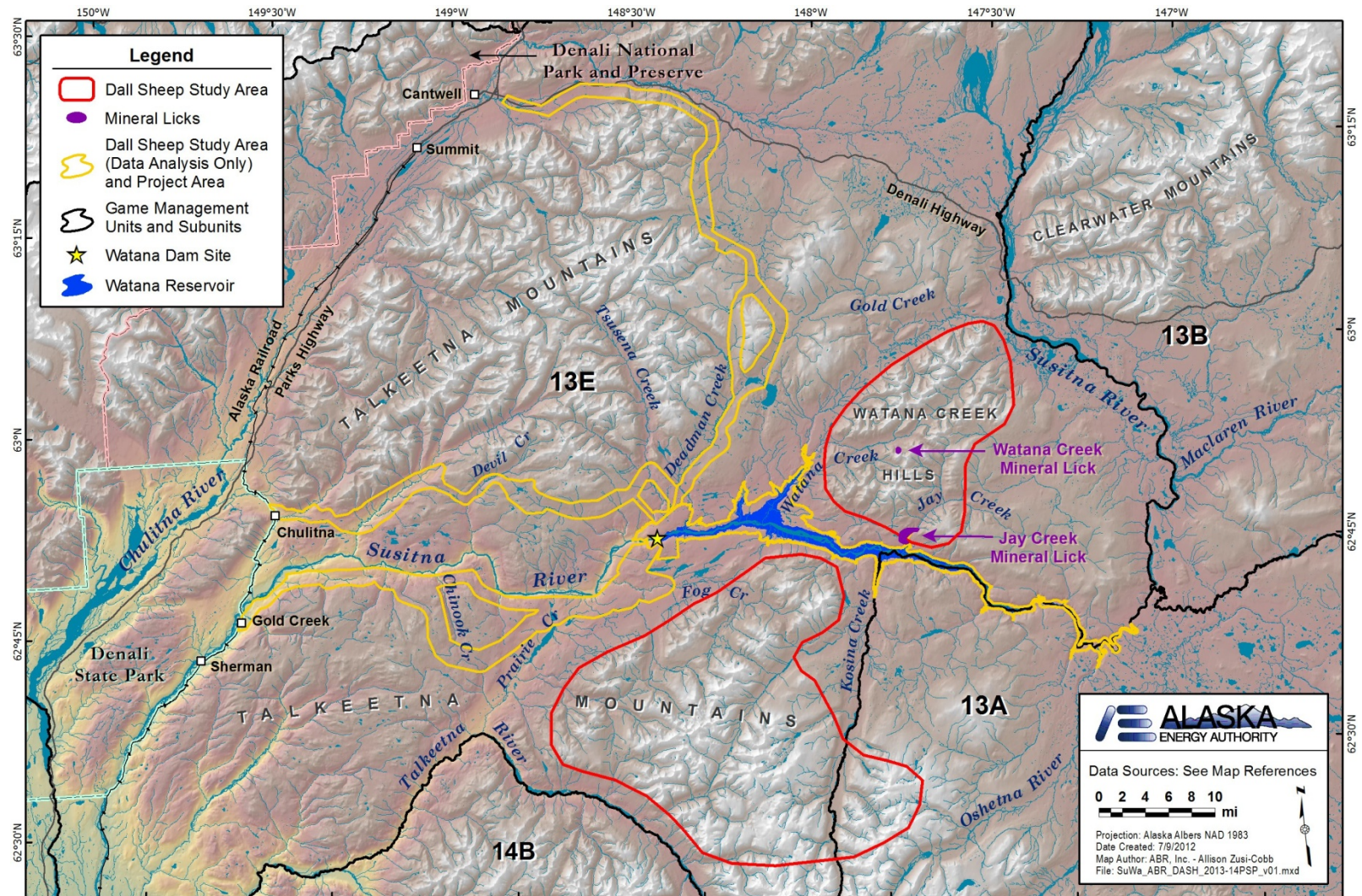
# Objectives: Dall's Sheep

- Estimate current population size of Dall's sheep in Project area
- Delineate summer range of Dall's sheep in Project area
- Assess condition and use of mineral licks in Project area
- Analyze and synthesize data from historical and current studies of Dall's sheep in Project area as a continuation of AEA 2012 study W-S1.





# Study Area: Dall's Sheep



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# Methods: Dall's Sheep

- Aerial survey for summer (late June/early July) distribution and minimum population estimation
- Ground observations and time-lapse photographic monitoring of use of Jay Creek and Watana Creek mineral licks
- Analysis of historical (APA Susitna Hydro Project) data and synthesis with recent ADF&G population-monitoring data

# Expected Results: Dall's Sheep

- Minimum population estimate of sheep in study area
- Summer distribution of sheep population in study area
- Minimum number and population composition of sheep using Jay Creek and Watana Creek mineral licks
- Seasonal timing of mineral lick use
- Spatial patterns of use of Jay Creek mineral lick in relation to probable maximal pool elevation of reservoir



# Summary of 2012 Activities: Dall's Sheep

- Acquisition and analysis of ADF&G population survey data (no telemetry data available)
- August 2012: Site visit to Jay Creek and Watana Creek mineral licks to evaluate options for 2013–2014 study methods (e.g., time-lapse photography and behavioral observations)





## Discussion: Dall's Sheep

- Study plan incorporates input from ADF&G regarding need for summer-only data, rather than year-round range-use data.
- Jay Creek mineral lick use will be characterized despite ADF&G remarks indicating that existing data should be adequate.
- Any questions or concerns with the proposed study plan content?





# Objectives: Wolverine

- Describe winter distribution of wolverines
- Describe winter habitat use by wolverines
- Estimate current population size of wolverines.



# Objectives: Terrestrial Furbearers

- Develop population estimates of coyotes and red foxes through collection of scats along trails and rivers in the study area during winter months (January–March) in 2013 and 2014
- Develop a population estimate of marten through collection of hair samples in the reservoir inundation zone using hair-snag tubes
- Develop a population estimate of lynx through collection of hair samples in the study area using hair-snag plates
- Develop indices of prey abundance in the study area by recording snowshoe hare (*Lepus americanus*) sign and estimating vole abundance
- Conduct genetic analyses of fecal and hair samples to confirm species identity and to differentiate individual animals
- Calculate furbearer population estimates using genotype data and capture–mark–recapture statistics
- Compile furbearer habitat-use data.

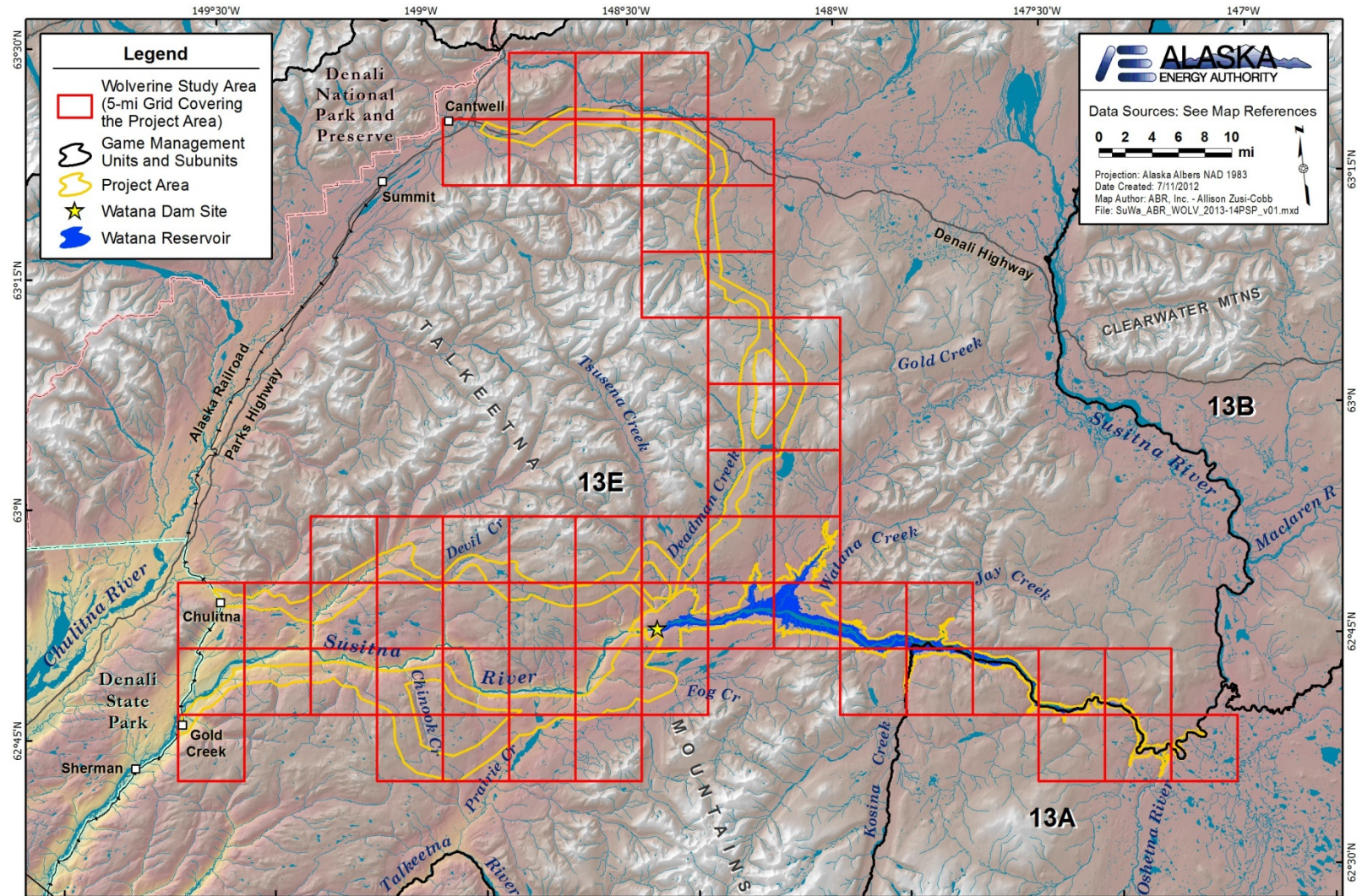


# Objectives: Aquatic Furbearers

- Delineate distribution and estimate current population size of beavers;
- Describe distribution and relative abundance of river otter, mink, and muskrat
- Document habitat use by aquatic furbearers
- Review available information on food habits and diets of piscivorous furbearers (river otter and mink) as background for Mercury Assessment and Potential for Bioaccumulation Study
- Collect and analyze fur samples from river otters and mink to characterize baseline tissue levels of mercury for the Mercury Assessment and Potential for Bioaccumulation Study.



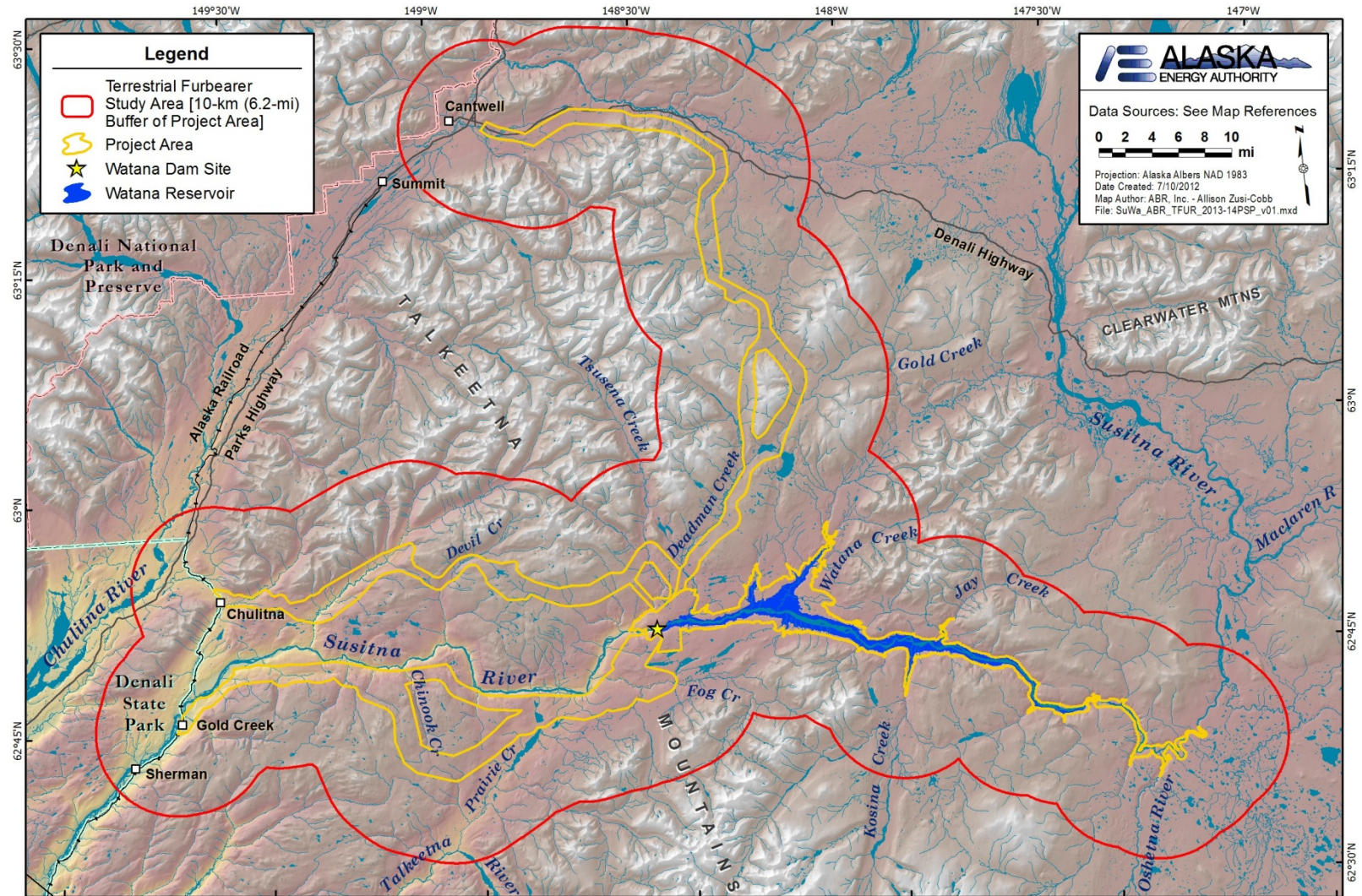
# Study Area: Wolverine



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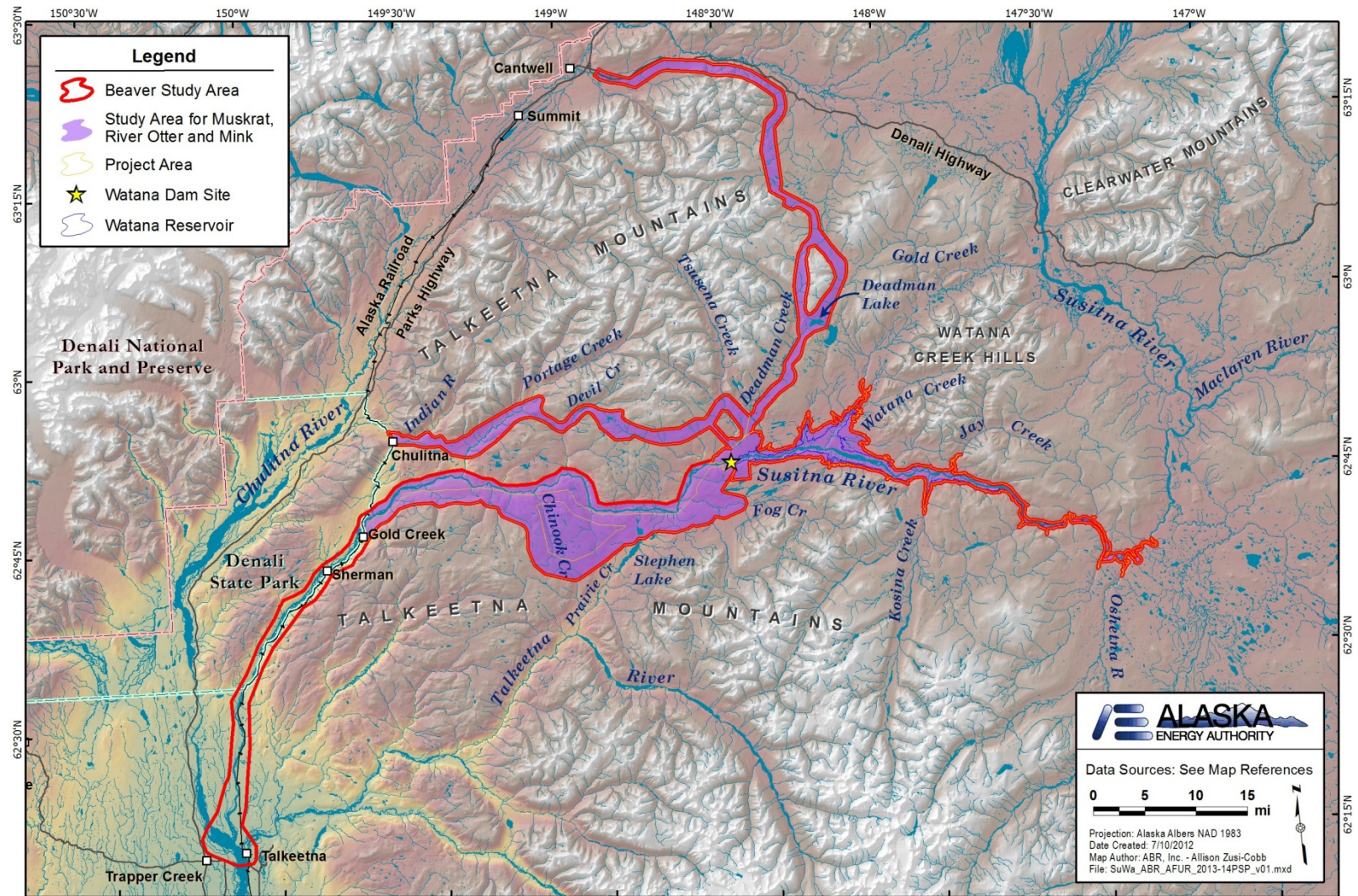
# Study Area: Terrestrial Furbearers



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# Study Area: Aquatic Furbearers



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# Methods: Wolverine, Terrestrial and Aquatic Furbearers

- Wolverine
  - Winter aerial survey using snow-tracking and Sample-Unit Probability Estimator (SUPE) method
  - Review and synthesis of historical data
- Terrestrial Furbearers
  - Genetic analyses of scat and hair samples
  - Population estimation using mark-recapture methods
  - Habitat use
  - Prey population indices (snowshoe hare, voles)
- Aquatic Furbearers
  - Aerial surveys of active beaver lodges/food caches in fall and spring
  - Winter aerial surveys of ponds and lakes for muskrats
  - Winter aerial snow-tracking surveys of river otter and mink
  - Baseline mercury levels from hair samples (trapper carcasses and terrestrial furbearer study)



## Expected Results: Wolverine, Terrestrial and Aquatic Furbearers

- Data on winter distribution and habitat associations
- Population estimates for wolverine, terrestrial furbearers, beaver, and possibly mink
- Minimum count of river otters
- 1<sup>st</sup> year results may be used to revise survey approaches for 2<sup>nd</sup> year of study
- Survival estimates based on DNA samples of terrestrial furbearers and overwinter surveys of active beaver lodges
- Baseline levels of mercury from hair samples of piscivorous species (river otter and mink)
- Information on food habits and diets of river otter and mink





# Relationship to Other Studies: Wolverine, Terrestrial and Aquatic Furbearers

- Terrestrial and Aquatic Furbearer studies (cooperative collection of hair samples and incidental field observations)
- Small Mammals study (prey species composition and abundance, habitat associations)
- Mercury Assessment and Potential for Bioaccumulation Study (background information and data input)



# Summary of 2012 Activities: Wolverine, Terrestrial and Aquatic Furbearers

- No historical data (APA Susitna Hydro Project) on wolverines were available for analysis, although major findings were published; data from other wolverine surveys in or near the study area will be requested from ADF&G
- Late August 2012 — Field survey of prey abundance indices for terrestrial furbearer study:
  - Establish 8–10 hare pellet plot grids and count pellets
  - Conduct grid-based vole trapping for population estimates
- (No field work in 2012 for aquatic furbearers)



## Discussion: Wolverine, Terrestrial and Aquatic Furbearers

- An SUPE survey approach has been proposed for wolverine, consistent with ADF&G advice, and ADF&G biologists will be consulted regarding the design and execution of that survey.
- ADF&G comments have been incorporated into the terrestrial furbearer study plan, but further consultation should be conducted to ensure that all concerns are satisfied.
- The aquatic furbearer study plan attempts to address comments from both ADF&G and USFWS, which were contradictory regarding the need for the study. Hence, further discussion may be warranted among those agencies and AEA.
- Any other questions or concerns with the content of these proposed study plans?



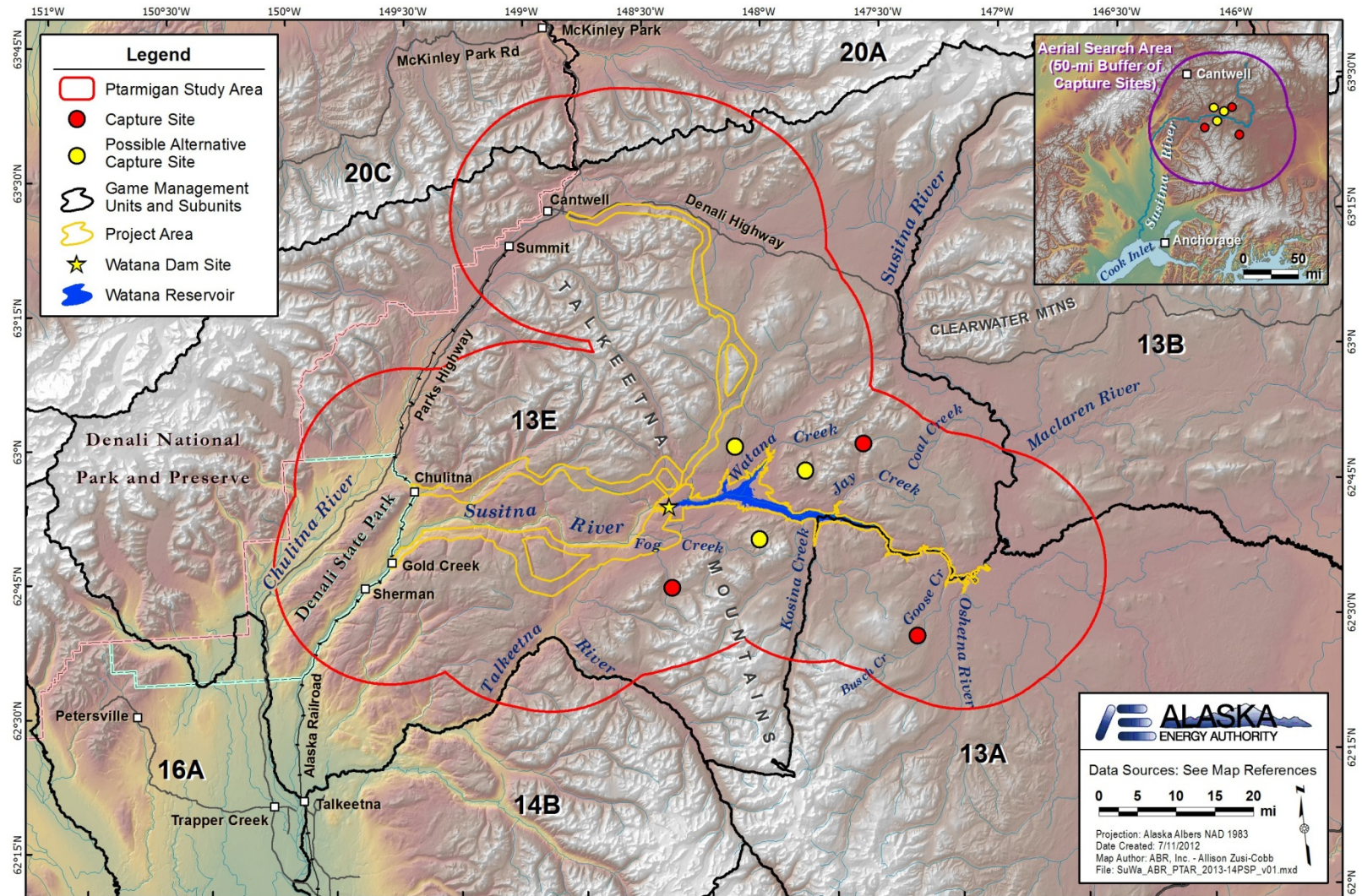


# Objectives: Willow Ptarmigan

- Determine the seasonal distribution of Willow Ptarmigan in the Project area
- Determine the seasonal migratory patterns of Willow Ptarmigan that occur in the Project area
- Estimate the abundance of ptarmigan in the Project area during the breeding season and during the fall
- Estimate seasonal survival of Willow Ptarmigan.



# Study Area: Willow Ptarmigan



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# Methods: Willow Ptarmigan

- Capture and radio-tagging of ptarmigan in April/May and August/September (25–50 birds each trip, for a total of 50–100 birds)
- Radio-tagged ptarmigan will be relocated during up to 8 aerial tracking flights annually
- Spatial analysis of telemetry data will employ multistate models to estimate movement and survival rates, and occupancy models of aerial survey data will be used to estimate the probability of use of different areas by marked birds





# Expected Results: Willow Ptarmigan

- Delineation of seasonal distribution patterns of ptarmigan in the study area
- Characterize seasonal migration patterns of ptarmigan in the study area
- Population estimation of breeding and fall populations in the study area
- Estimation of seasonal survival rates of ptarmigan in the study area.



# Summary of 2012 Activities: Willow Ptarmigan

- Capture and telemetry techniques were tested by tagging and radio-tracking 6 male willow ptarmigan in the Project area.

## Discussion: Willow Ptarmigan

- BLM comments (1) requested assessment of recruitment through age-structure classification of captured birds; (2) questioned the adequacy of the capture sample size and number of capture locations; (3) requested more clarification regarding the analytical models to be used. Input will be sought from ADF&G for the RSP, and a follow-up meeting may be appropriate.
- USDI comments regarding migratory birds are not applicable to ptarmigan, which are nonmigratory, resident species managed by the State of Alaska; hence, further clarification by USFWS is needed regarding ptarmigan.
- Other questions or concerns with the proposed study plan content?

