Eklutna Hydroelectric Project
Year 2 Study Results
Terrestrial Wildlife

Terrestrial TWG Meeting
March 29, 2023

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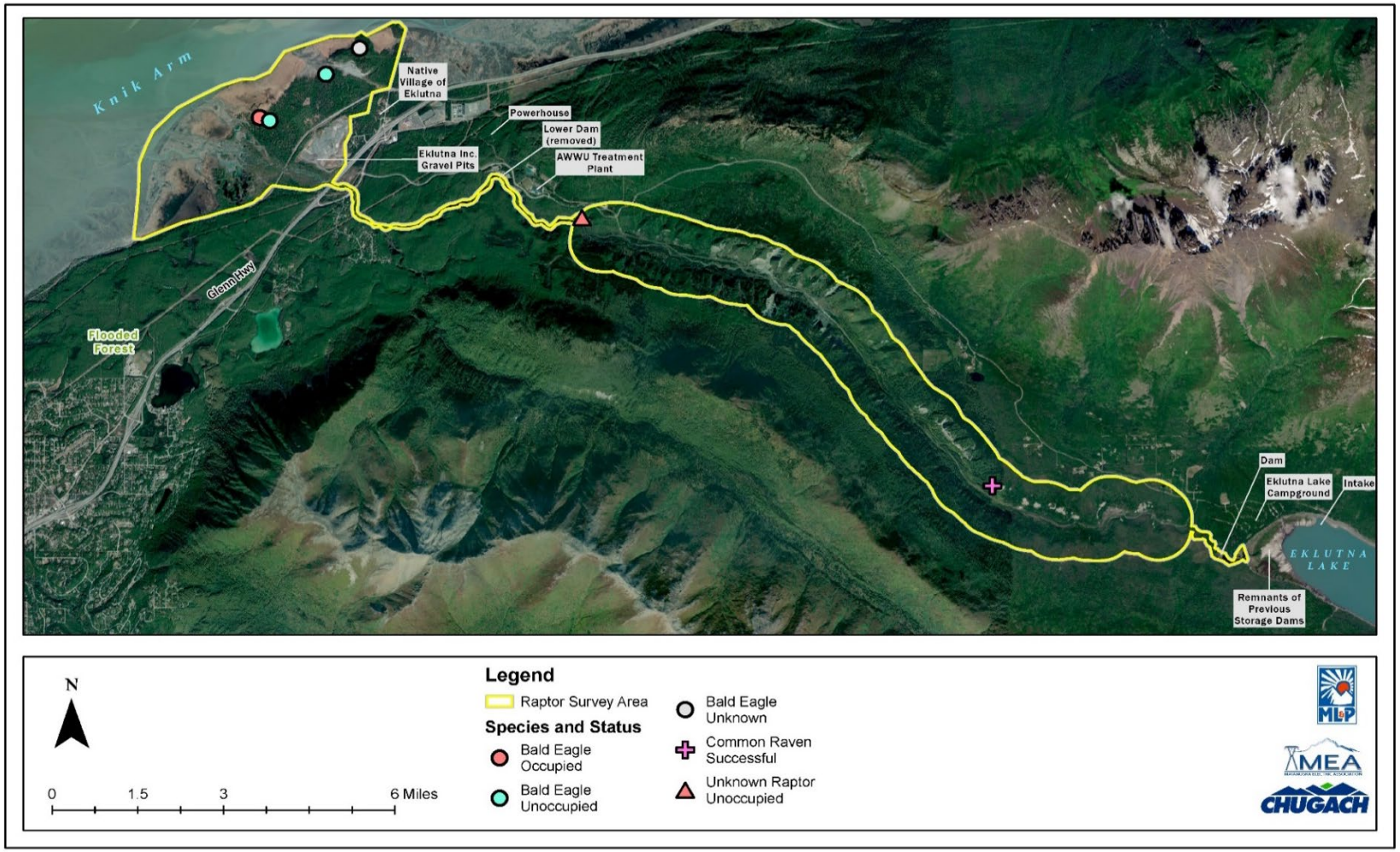
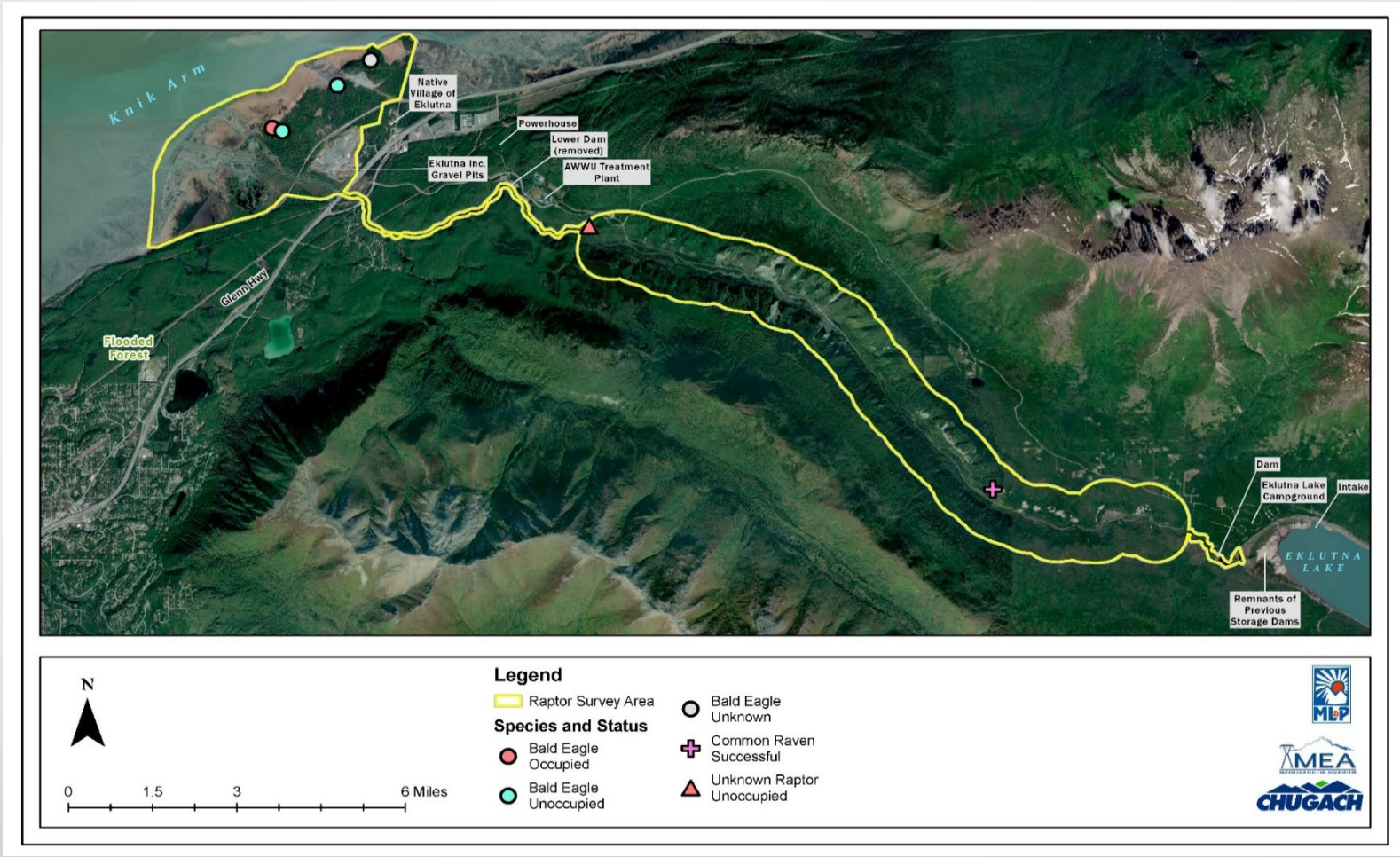
Raptor Nests – Methods

- Survey conducted 9 May 2022
- Robinson R-44 piston helicopter with 2 experienced observers looking for tree-nesting and cliff-nesting raptors
- USFWS protocols for eagle nests



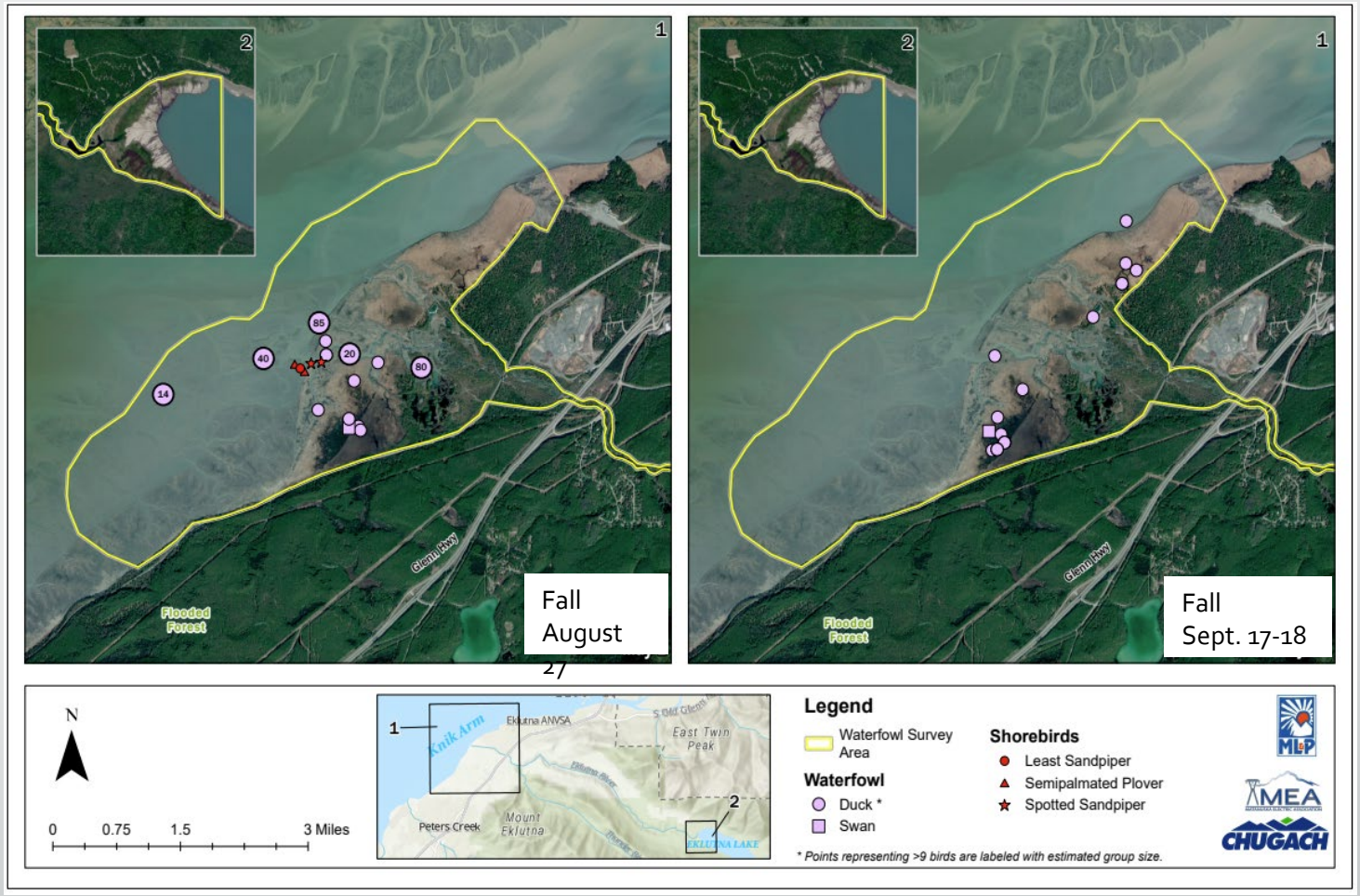
Raptor Nests – Results

- 4 Bald Eagle nests, likely in 2 territories. 1 nest conclusively occupied. Suitable nesting sites limited to coastal areas.
- No Peregrine Falcons nest located in canyon, although habitat looked good.
- 1 raven or goshawk nest located in the valley. Habitat looked good for goshawk nesting.
- 1 Raven nest found farther upstream
- Eroding cliff substrate in middle and upper river is very low-quality for nesting.



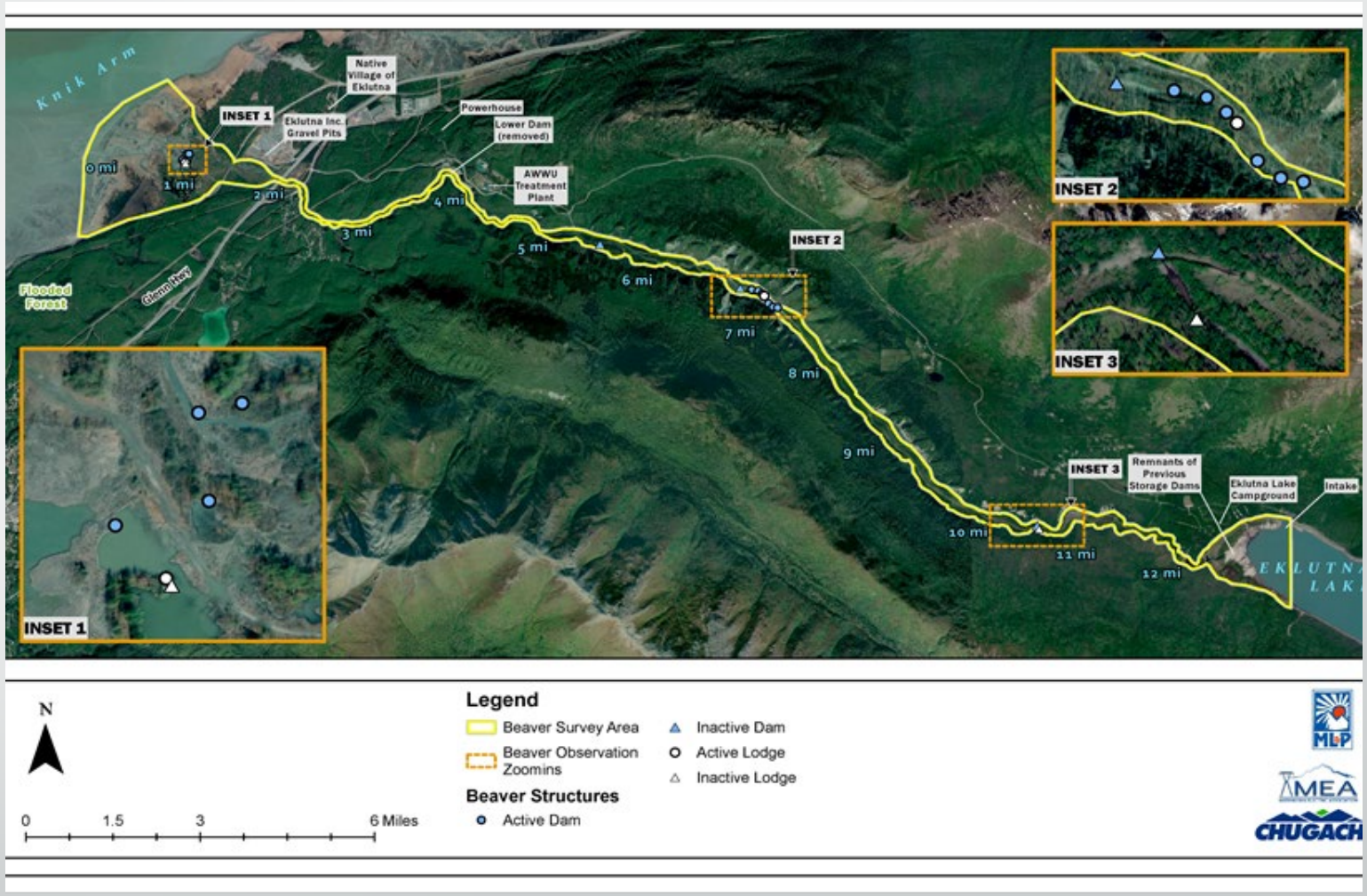
Waterfowl/Shorebird Surveys – Results

- 97% of waterfowl and shorebirds were found in the lower river saltmarsh and mudflats.
- Waterfowl numbers, both numbers of species (11) and individuals (37-143 per survey), were moderate in the study area.
- Shorebirds were very low in abundance (13 individuals of 3 species) and only present in fall. USGS observations corroborate low shorebird use of mudflats in Knik Arm and Turnagain Arm.
- Other related waterbird species groups recorded included gulls and terns (moderate numbers), sandhill cranes (max of 5), and grebes (low numbers).



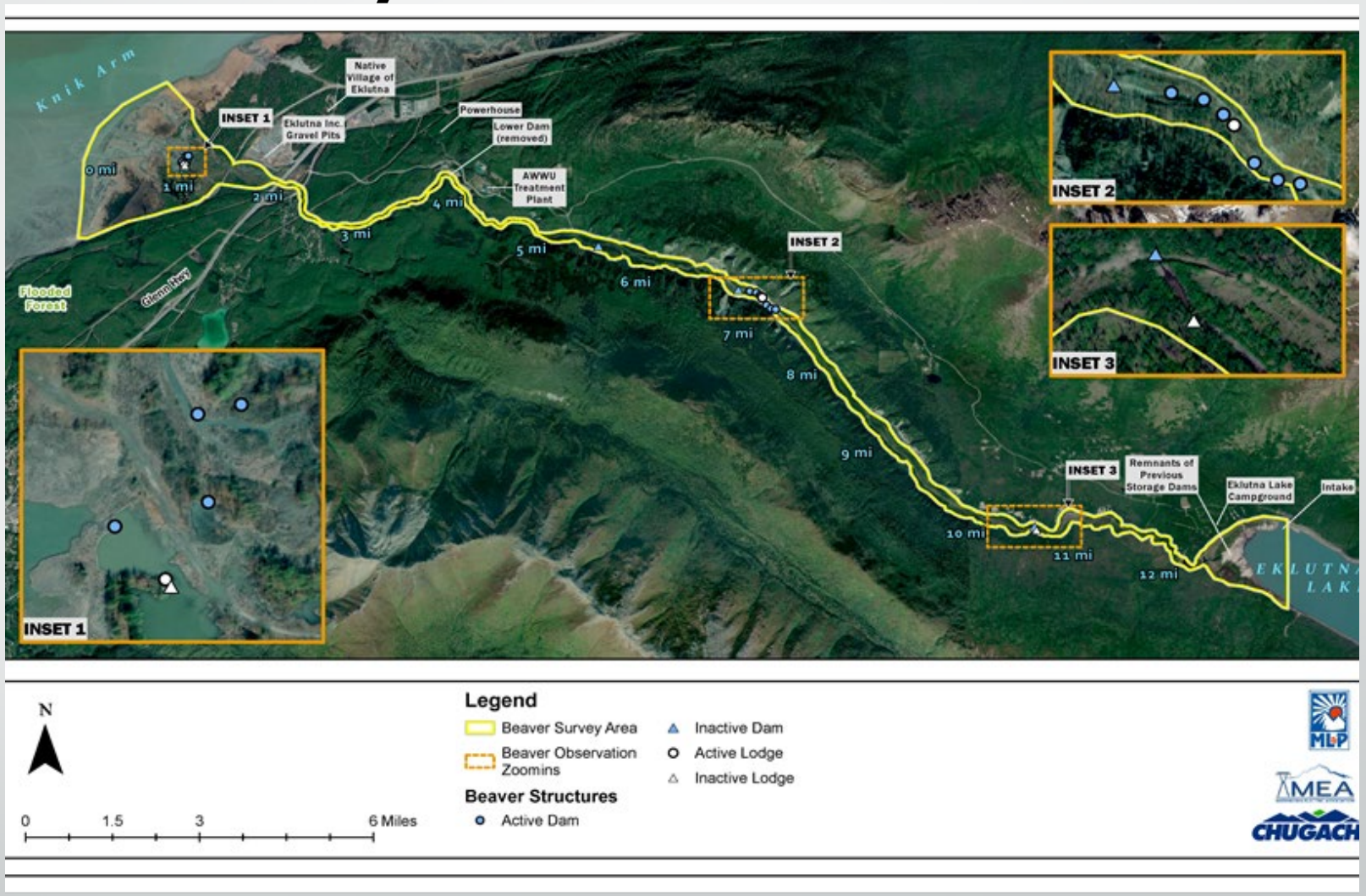
Beavers Surveys – Methods

- Conducted an aerial colony survey on 10 October 2022
- R-44 helicopter with single observer
- Ground-based observations on 22 September 2022
- Time-lapse cameras on 2 beaver ponds



Beavers Surveys – Results

- 3 active colonies in 2022, only 1 active colony in lower river beaver complex
- Beavers probably moved upstream shortly after lower dam removal.
- Upper river colony removed due to AWWU road flooding.
- Middle river colony flooding AWWU road by end of 2022.
- Middle river colony dams could present a barrier to migrating adult salmon.
- 2021 high-flow releases breached 2 dams and completely removed a third.
- Periodic high-flow releases could create attractive side-channel habitat and discourage beavers from damming the main channel.
- Upper 2 colonies had colony size of ≥ 3 beavers



Beaver Survey Observations

Beaver Complex

Middle River Colony: AWWU access road flooding and possible salmon barrier

Moose Browse Survey – Methods

- Surveys conducted 12–15 April 2022
- Used methods of Seaton et al. (2011)*
- 30 Sample Plots
- Sampled willow, black cottonwood (balsam poplar), Alaska birch, red-osier dogwood, and high-bush cranberry.
- Randomly selected up to 3 plants per species and up to 10 random twigs per plant
- Recorded number of twigs and diameter at the base of the current annual growth and at the point of browsing
- Sampled 2,281 twigs from 241 plants

Species	Number Twigs Sampled	Number Plants Sampled
Betula neoalaskana	528	54
Cornus stolonifera	92	10
Populus balsamifera	490	54
Salix alaxensis	595	63
Salix arbusculoides	10	1
Salix barclayii	50	5
Salix bebbiana	217	22
Salix pulchra	60	6
Viburnum edule	239	26

*Seaton. C. T., T. F. Paragi, R. D. Boertje, K. Kielland, S. DuBois, and C. L. Fllener. 2011. Browse biomass removal and nutritional condition of moose *Alces alces*. Wildlife Biology 17: 55–66.

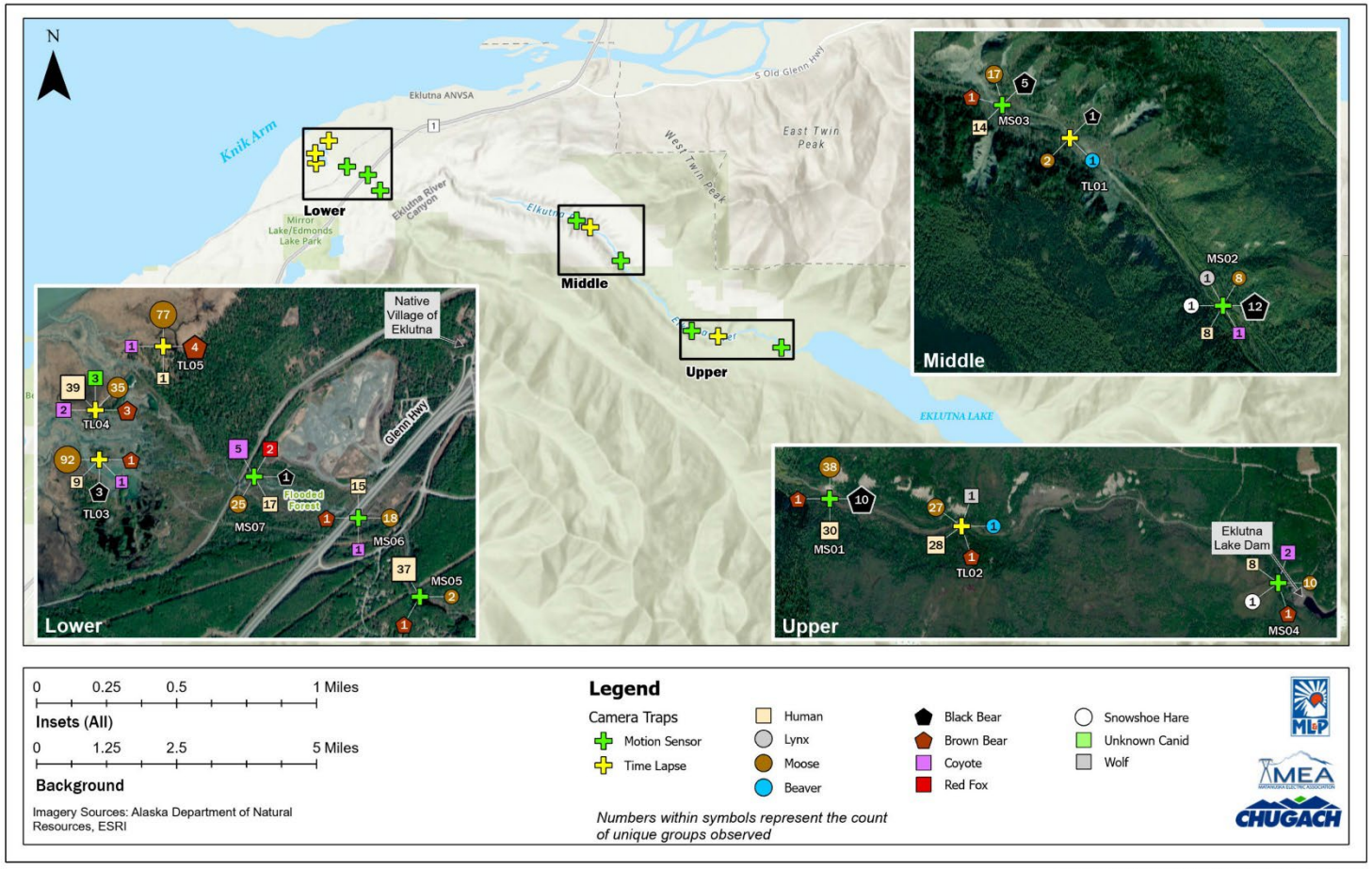
Moose Browse – Results

- 22% browse removal rate (95 CI 17–27%).
  - Indicative of a population that should be in good nutritional status with healthy twinning rates.
  - Browse surveys are just a snapshot in time (late winter 2022).
- Habitat looks “over-mature” in many places, with tall, old willows and thickets of cottonwood and birch dying-back or browse now too high for moose to reach.
- Lack of recent hydrological or mechanical disturbance to reset plant succession.

Species	Number Twigs Sampled	Number Plants Sampled	Mean Biomass Removal Rate (%)	Proportion Broomed Plants
Betula neoalaskana	528	54	0.5	18.5
Cornus stolonifera	92	10	12.0	40.0
Populus balsamifera	490	54	0.2	0.6
Salix alaxensis	595	63	40.8	58.7
Salix arbusculoides	10	1	0.0	0.0
Salix barclayii	50	5	30.0	0.0
Salix bebbiana	217	22	18.0	54.5
Salix pulchra	60	6	25.0	100.0
Viburnum edule	239	26	16.3	34.6

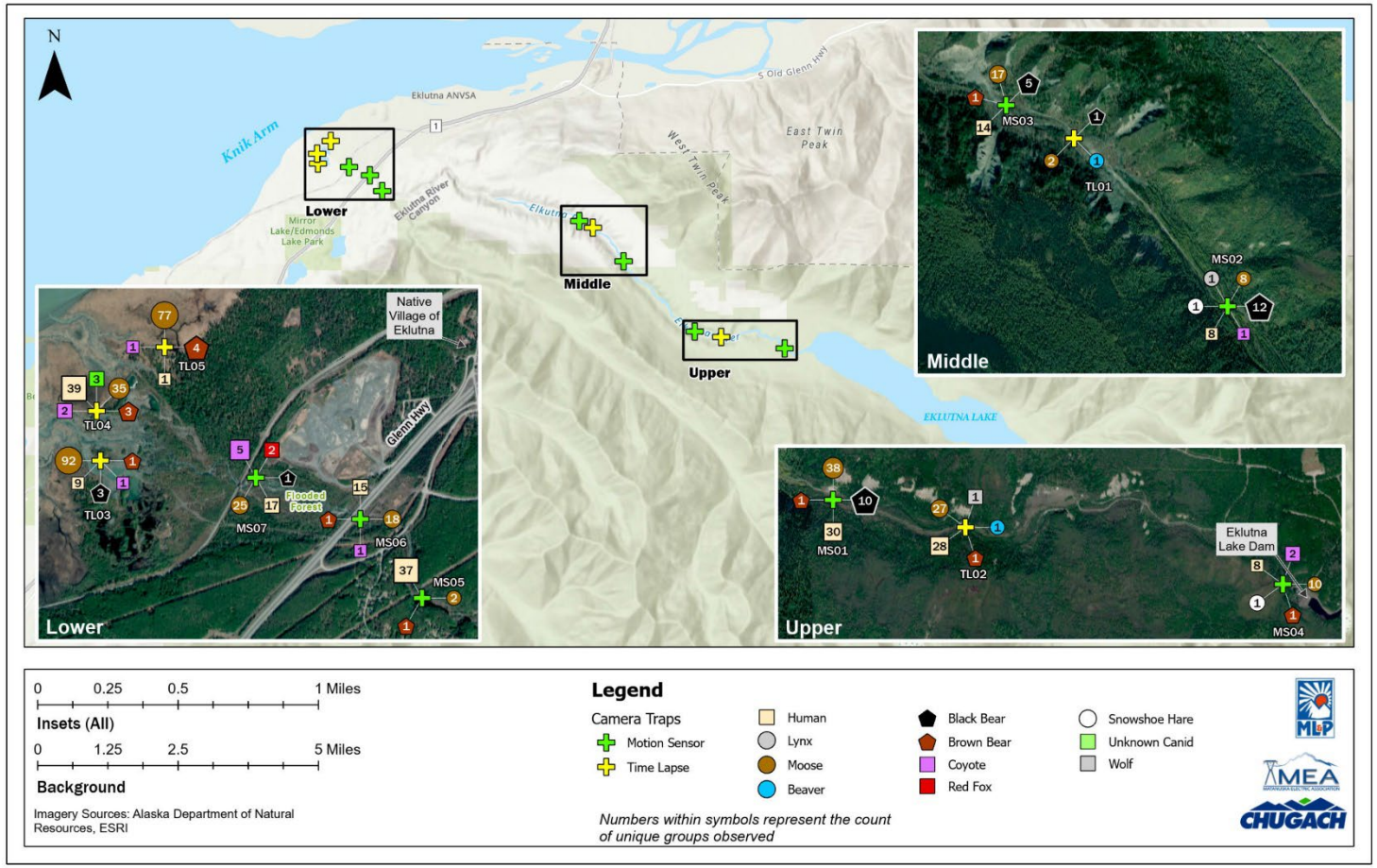
Camera Traps – Methods

- Deployed 12 Reconyx camera traps
- 5 time-lapse (covering large open areas)
- 7 motion-sensing (at trails or areas of funneled movements)
- Deployed April–May and retrieved mid-November
- Opportunistic wildlife observations also recorded by field teams



Camera Traps – Results

- Group Counts
  - Moose: 352
  - Black Bear: 32
  - Brown Bear: 14
  - Coyote: 13
  - Red Fox: 2
  - Snowshoe hare: 2
  - Wolf: 1
  - Lynx: 1
- Beaver: 2 colonies monitored
- Few moose twins observed contrary to browse survey results; moose calf predation?
- Multiple black and brown bears recorded, some with 1–3 cubs.



Camera Traps – Example Photos

Habitat Evaluation – Methods

- 23 wildlife habitat types identified and mapped in the Wetlands and Wildlife Habitat study
  - 7 freshwater habitats and adjacent littoral zones
  - 6 saline-influenced waters and wetlands
  - 4 palustrine wetlands
  - 5 well-drained uplands
  - 1 human-modified type
- Categorical habitat-value rankings (high, moderate, low, or negligible value) assigned to each mapped wildlife habitat type for each bird, mammal, and amphibian species known or expected to occur regularly in the study area
- Rankings based on available project data, habitat-use data from other wildlife studies in Southcentral Alaska, the scientific literature on habitat use for each species, and/or professional judgement based on extensive field experience in Southcentral Alaska

Habitat Evaluation – Results

Primary Habitat Change Result:

- Mapping of historical (1950) conditions indicates that prior to completion of the upper dam and water diversion for the current project in 1959, riparian shrub habitats were more extensive in the Eklutna River drainage (151 acres in 1950 vs 47 acres in 2022).
- Affected riparian shrub areas are now transitioning to more well-drained upland deciduous-spruce forest habitats.
- This change likely due to reduction in heavy historical flows that could have occurred twice or more annually (spring snow melt and fall rains), which would reset riparian plant succession.
- 19 bird and mammal species that favor riparian shrub habitats and were ranked as high value for that habitat (landbirds and moose in particular) likely have been negatively affected. Changes would have occurred gradually over time with the reduction in riparian shrub habitat availability.
- 31 forest-dwelling bird and mammal species that favor upland forest habitats and were ranked as high value for that habitat likely have gradually experienced positive effects of an increase in habitat availability.

Habitat Evaluation – Results

Secondary Habitat Change Result:

- Fluctuations in Eklutna Lake levels have substantially increased extent of the lake littoral zone at the mouth of the lake, which was far smaller in 1950 (~ 13 acres in 1950 vs 114 acres in 2022).
- This lake littoral zone may be commonly used by at least 5 species of birds and wood frogs (ranked as high values for the habitat). Likely to be used primarily for foraging. Nesting for most bird species is unlikely due to lack of vegetative cover.
- Human disturbance from the nearby Eklutna Lake Campground likely will limit use of the littoral zone by wildlife in spring, summer, and fall.