SUSITNA-WATANA HYDRO *Clean, reliable energy for the next 100 years.*

SUSITNA-WATANA
HYDROELECTRIC PROJECT

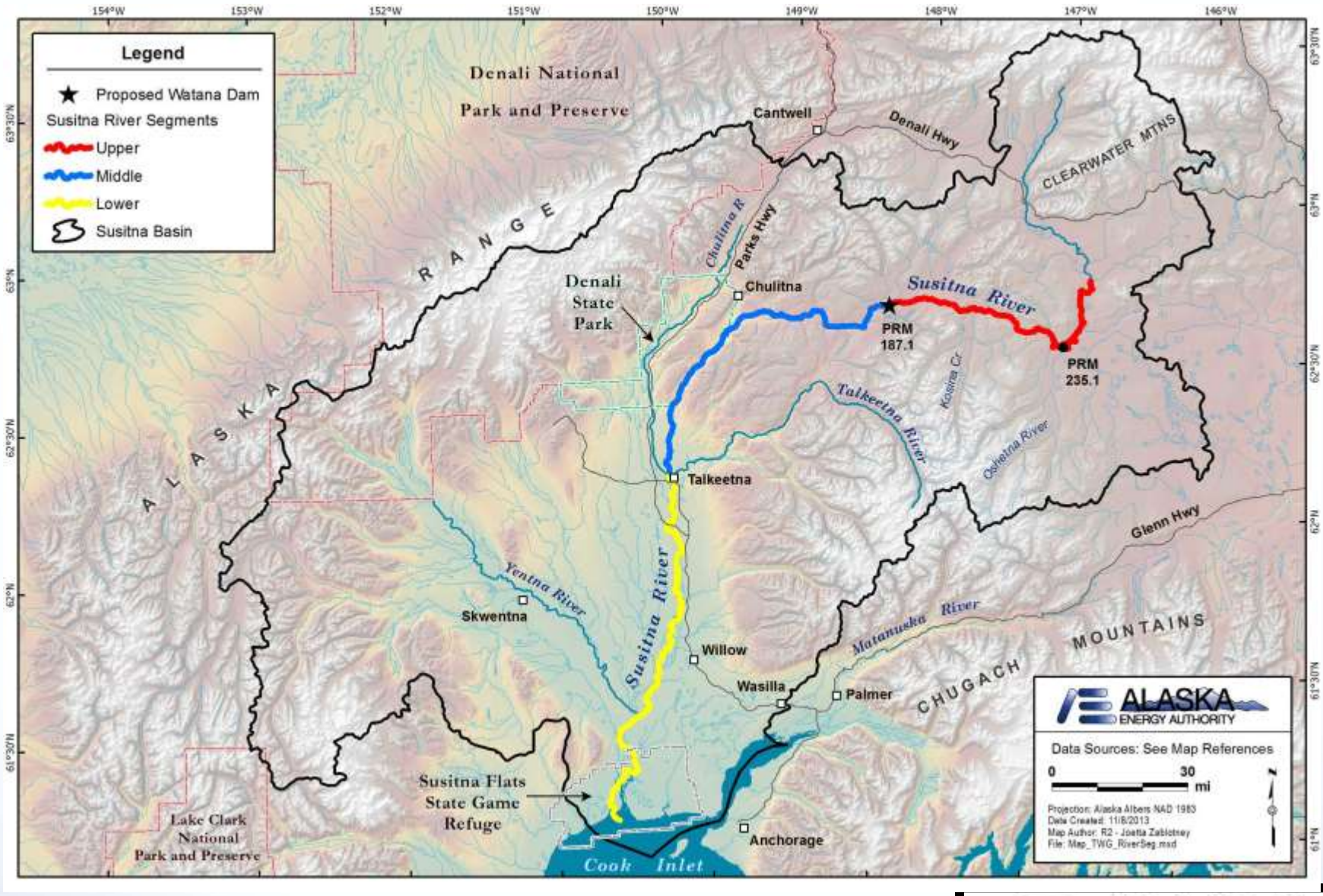
Fish and Aquatic Studies Overview

November 13, 2013

Study Collaborators :

Alaska Energy Authority ,
ABR Inc.,
Alaska Department of Fish & Game ,
DESIT Inc.,
Golder Associates,
HDR Inc.,
LGL Limited,
R2 Resource Consultants Inc., and
University of Alaska Fairbanks

ALASKA ENERGY AUTHORITY



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13 F&A studies planned: 3 started in 2012, 7 more started in 2013

Fish Distribution and Abundance (FDA) Upper River

Fish Distribution and Abundance Middle and Lower River

Salmon Escapement

River Productivity

Habitat Characterization

Fish Passage Feasibility

Fish Passage Barriers

Genetics Baseline

Eulachon Run Timing, Distribution and Spawning

Cook Inlet Beluga Whales

Future Reservoir and Entrainment

Access, Alignment, Transmission, and Construction Areas

Fish Harvest

FDA Upper River: Describe the seasonal distribution, relative abundance of fish in different habitats.

- 2 events in June looking for juvenile salmon, 41 sites
- Broadcast sampling:
  - 3 sampling events: July, August, September
  - 20 transects, 16 tributaries, 181 sites total

FDA Middle and Lower River: Describe the seasonal distribution and relative abundance of fish in different habitats

- 2-4 events looking for juvenile salmon: May/June, ~80 sites
- 3 broadcast sampling events: July, August, September
  - 168 mainstem sites and 15 tributaries in Middle River
  - 44 sites at 10 Lower River transects

Multiple Sampling Methods

6 Rotary Screw Traps

…also on the Oshetna River and Susitna River - Curry

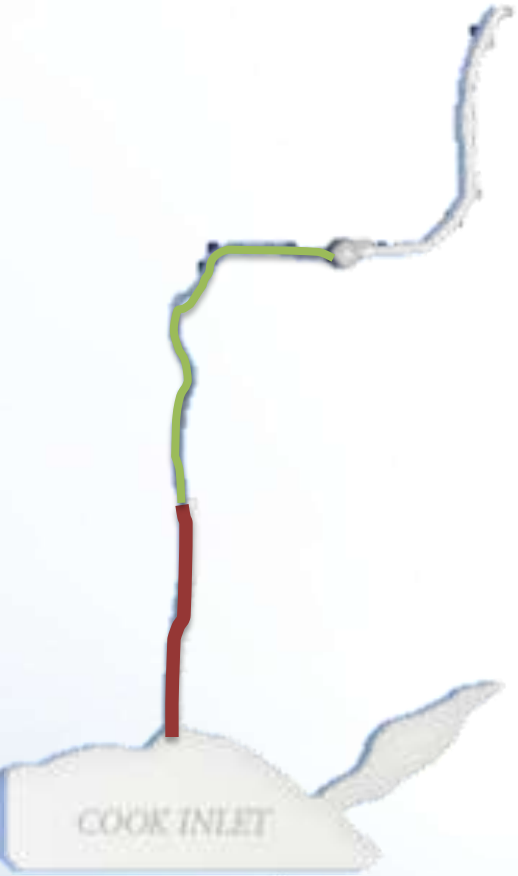
Salmon Escapement

Lower, Middle & Upper River

- Intense fishwheel operations:
  - 2 @ Yentna River
  - 2 @ PRM 36 upstream of Yentna
  - 3 @ PRM 126 near Curry
- Salmon radio-tagged : 2,915 in 2012; 3,424 in 2013
- 23 fixed telemetry stations from RM 29 to RM 234
- > 60 days of aerial telemetry surveys flown annually
- Sonar used at fish wheels and throughout Middle River below DC, tested at proposed dam site.
- Picket weirs on Indian, Montana, & Deshka

Radio-tagged Salmon

MIDDLE AND LOWER RIVER



Curry Station (RM 126)

- 603 Chinook
- 200 pink
- 201 chum
- 137 sockeye
- 207 coho

Susitna River (RM 36)

- 700 Chinook
- 200 pink
- 596 coho

Yentna River

- 690 Chinook

Adult Salmon Aerial Counts

- Surveyed 19 tributaries and the mainstem Susitna River from Devils Canyon to RM 235.
- Weekly surveys mid-July – August, 2012 & 2013
- Conditions :
  - -Generally good,
  - -Black and Oshetna Rivers zero visibility due to glacial till,
  - -Some localized visibility issues due to landslides, white water, tree canopy.
- Chinook salmon located in 6 tributaries within or upstream of Devils Canyon:
  - -1 in UR – Kosina
  - -3 in MR – *Tsusena*, Fog, Devil, Chinook , Cheechako.

River Productivity Study: Document the primary and secondary productivity of the Susitna River

- Seasonal sampling events:
  -Post-break up, summer, and fall.
- ~ 474 samples collected per event.
- Sampling for macroinvertebrates periphyton and organic matter,
- Methods include Hess, drift , grab, and snag samples, artificial substrates, emergence traps plankton tows, scraping substrates for algae.

- River Productivity data will be compiled to establish baseline condition for the Susitna River.
- Stable isotope analysis will move us beyond benthic communities to identify trophic pathways in this system.
- Data also will be modeled to relate productivity to fish growth.

RSP 9.9 Habitat Characterization and Mapping Study

- Mapped aquatic habitat for over 200 miles of mainstem river and 25 tributaries.
- Combination of remote mapping and field surveys
  - Remote imagery used LiDAR, aerial photography, high resolution video
  - Field surveys a modified version of the US Forest Service protocol.

Upper River focus was on Chinook tributaries and habitat that would be inundated with a future reservoir.

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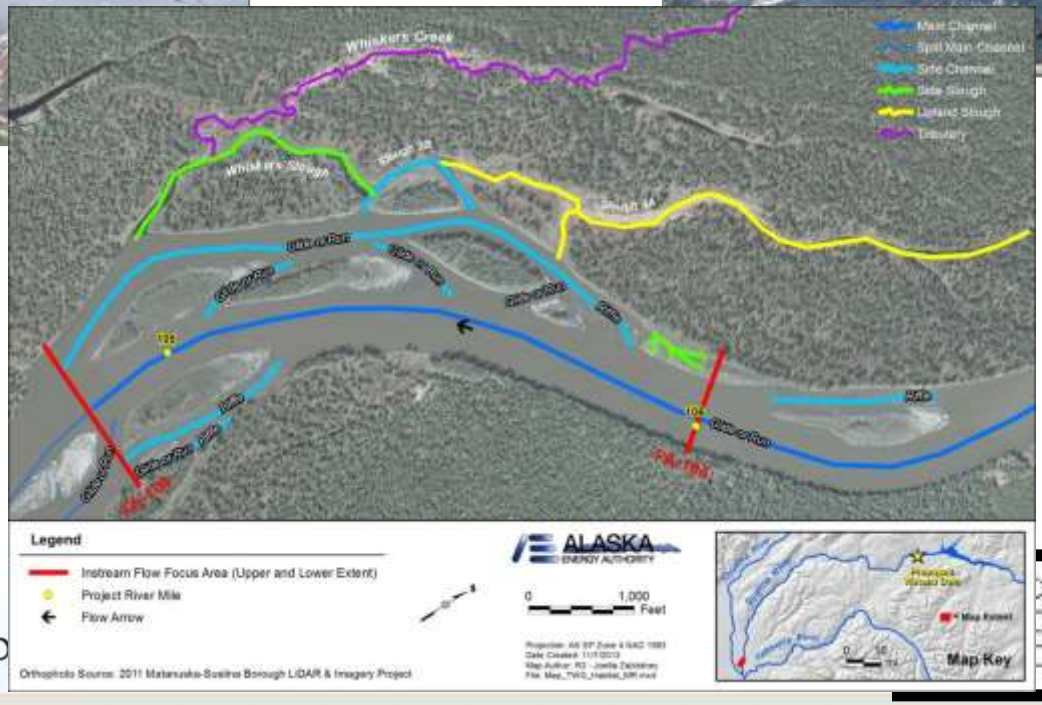
Middle River received 100% coverage mainstem habitats and representative tributaries with potential to be affected by operational flows.



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Lower River mapping from aerial photography limited to geomorphic scale.

Any Questions?