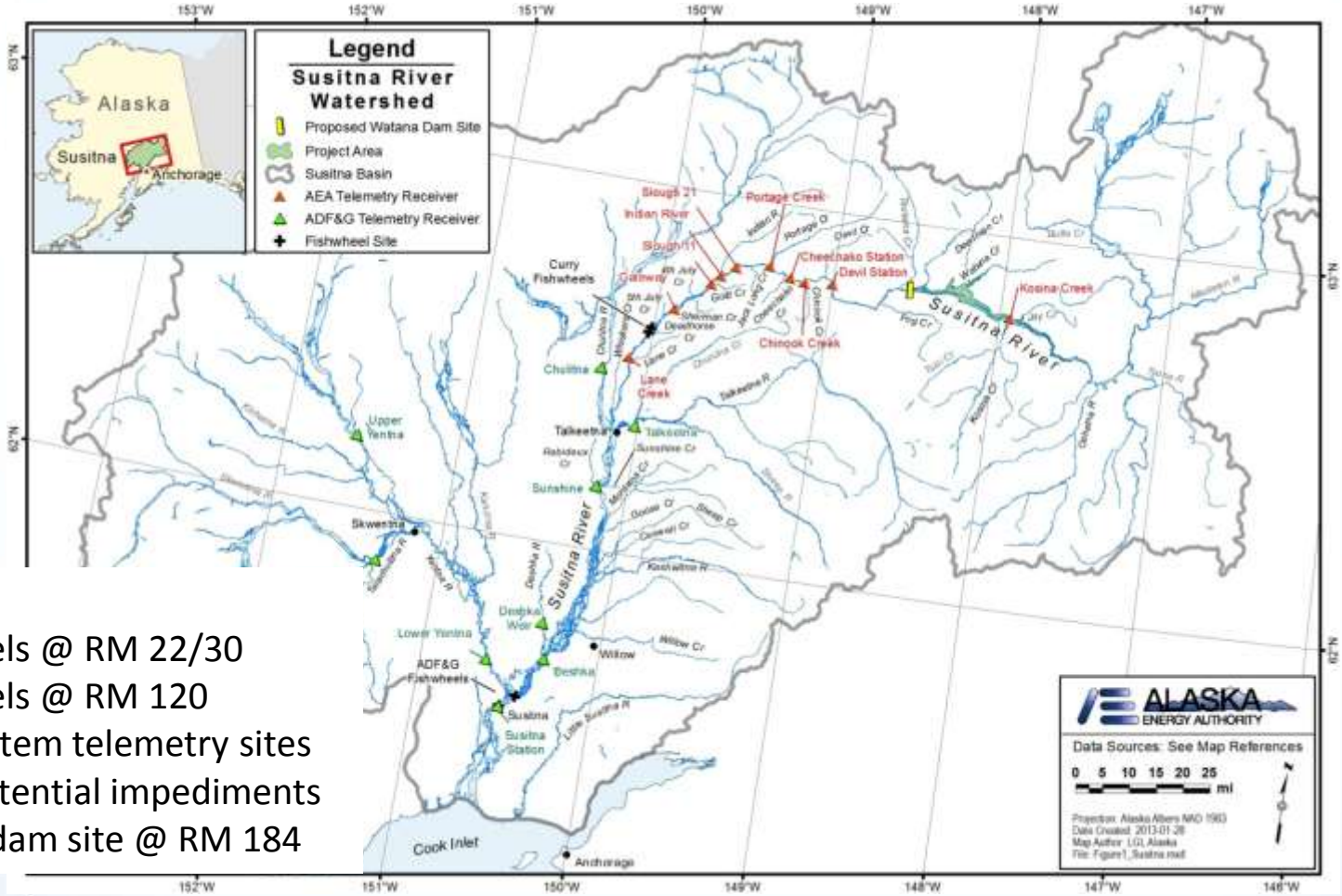
Susitna-Watana Hydroproject

Adult Salmon Distribution and Habitat Utilization Study, 2012

Study Purpose

- Characterize adult salmon migration to the Susitna River
- Identify locations of potential salmon spawning
- Compare characterizations with 1980s studies
- Evaluate techniques (e.g., fishwheels, radiotelemetry, sonar, etc) for future application

Study Area



POI's:

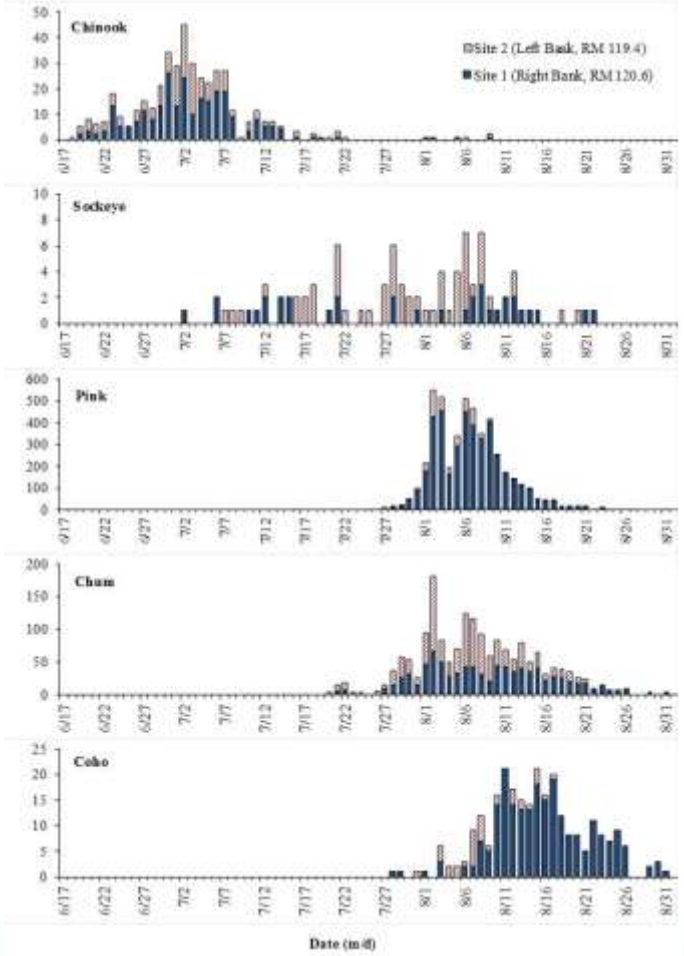
- Fishwheels @ RM 22/30
- Fishwheels @ RM 120
- 14 mainstem telemetry sites
- Three potential impediments
- Watana dam site @ RM 184

(Figure 1 of report)

Study Highlights (Effort)

- 7,370 salmon captured and 1,115 radiotagged at Curry
- ~ 31 aerial telemetry tracking and visual surveys
- 4 turbid water sonar spawning surveys
- 17 aerial/boat/foot spawning surveys covering 16 separate sites
- 3 dedicated foot surveys for Chinook spawner/carcasses
- 11 sockeye and 32 chum HSC redd samples over 8 sites

Study Highlights

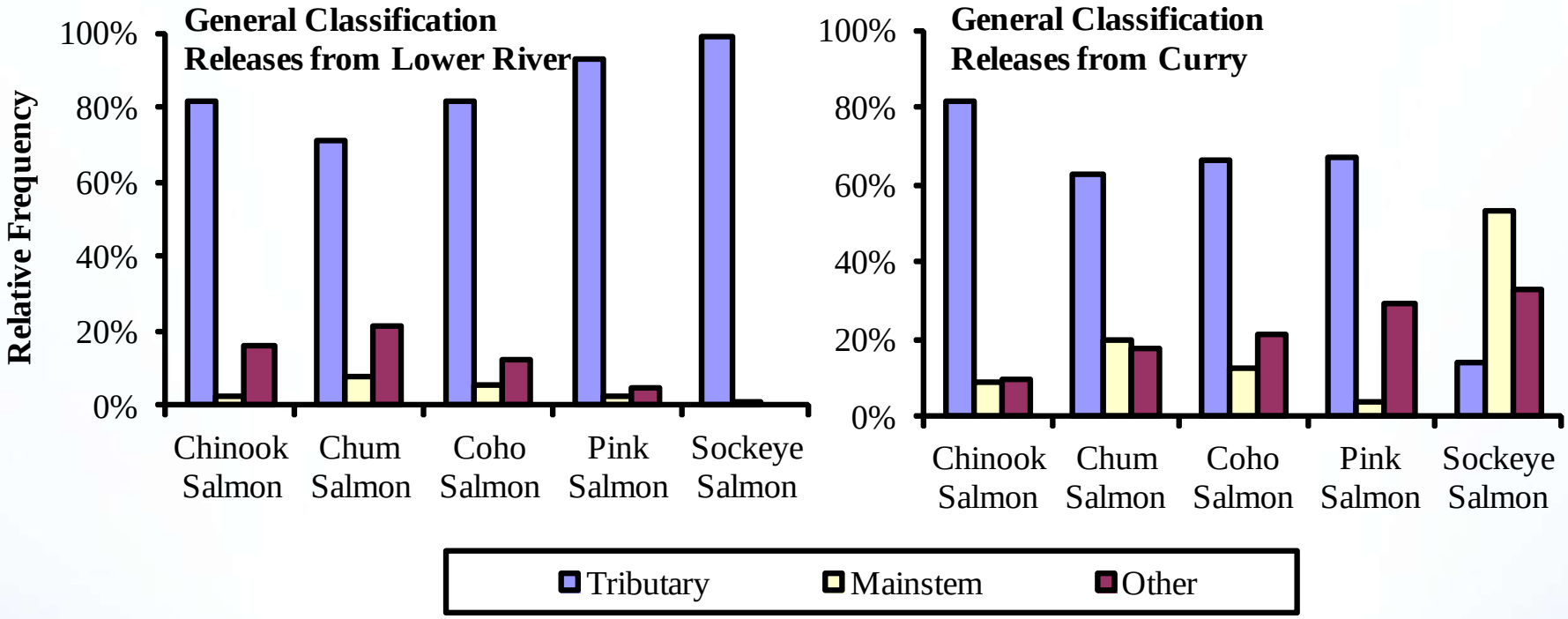


(Figure 8 of report)

Study Highlights (Destinations)

- 70% - 100% of tags (among species) were assigned to a destination
- Tributaries were the predominant spawning habitat
- Proportion of Curry-tagged salmon in mainstem spawning habitats
  - 9% Chinook, 20% chum, 13% coho, 4% pink, 53% sockeye
- Chum and sockeye salmon spawning visually confirmed in mainstem spawning habitats
- Approximately 10% of tagged salmon displayed roaming behavior

Study Highlights (Destinations)

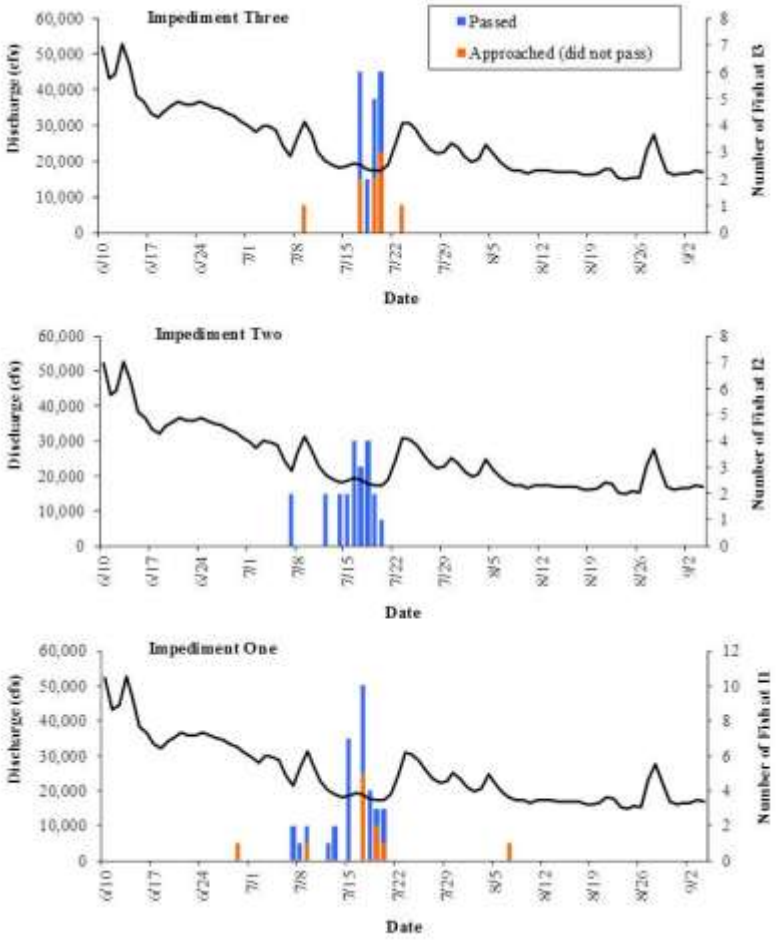


(Figure 22 of report)

Study Highlights (above DC)

- Chinook only salmon above Devils Canyon
- 50% of Chinook passing an impediment in DC were subsequently tracked to destinations downstream
- Four (1%) Curry-tagged Chinook and two (<1%) Lower River-tagged Chinook had destinations above Watana dam site
- Kosina Creek was the single destination for Chinook in the Upper River

Study Highlights (Chinook above DC)



Passage events: July 7 – 20
Discharge @ I1: 17-31 kcfs
Discharge @ I2: 17-21 kcfs
Discharge @ I3: 17-19 kcfs

(Figure 41 of report)

Study Highlights (vs. 1980s)

Similar

- No visual confirmation of Chinook or coho spawning in mainstem habitats, respectively
- Sloughs 11, 8A & 21 accounted for the largest proportion of sockeye & chum spawners in mainstem habitats

Contrasting

- In 2012, no visual confirmation of pink salmon spawning in mainstem habitats, respectively
- Radio telemetry used in 2012, and aerial visual counts used in 1980s to determine proportional use of habitats

Study Highlights (Techniques)

- **Fishwheels** – relatively high catch rates & meeting objectives, but coming short of meeting total catch & tag targets (Chinook, sockeye, coho).
- **Radiotelemetry** – highly effective methodology for determining destination down to meso-habitat. Adjustments to array are planned.
- **DIDSON** – important tool for assessing fish passage in proximity to the fishwheels. Will be used again in 2013, possibly to monitor coho.
- **SS Sonar** – good potential tool for viewing in turbid water, but requires an improved deployment platform for difficult operational conditions.

Study Highlights (Techniques)

- **Spawner/carcass surveys** – informative data, but can't achieve mark rate objective. Alternative method required (e.g., underwater video).
- **Spawning ground surveys** – visual verification of spawning in mainstem habitats is limited to relatively few clear water sloughs and tributary mouths, and is often dependent on discharge level.
- **HSC surveys** – straightforward method provides measures for IFM. General survey observations regarding site conditions at discharge are extremely valuable to understanding spawning habitat use.

Discussion