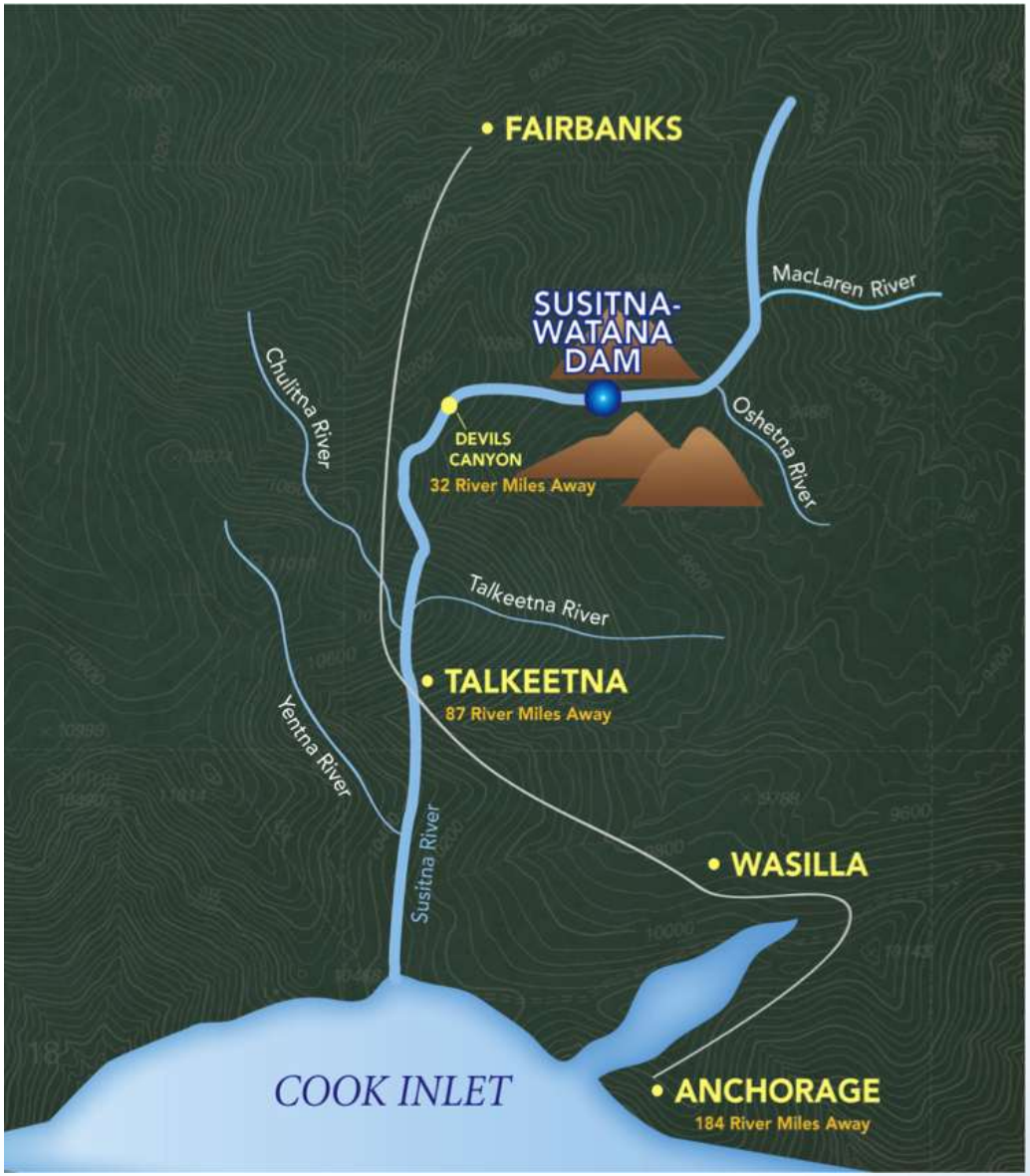
Baseline Water Quality Monitoring Focus Area Study

Susitna-Watana Hydro Electric Project

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

Focus Area Selection

- 10 focus areas were selected within the **Middle River**; segments 1,2,5,6,7,and 8.
- Areas are known to be biologically important for salmon spawning.
- Focus areas are representative of the entire project area.
- All study groups can obtain comparable data in the same locations.



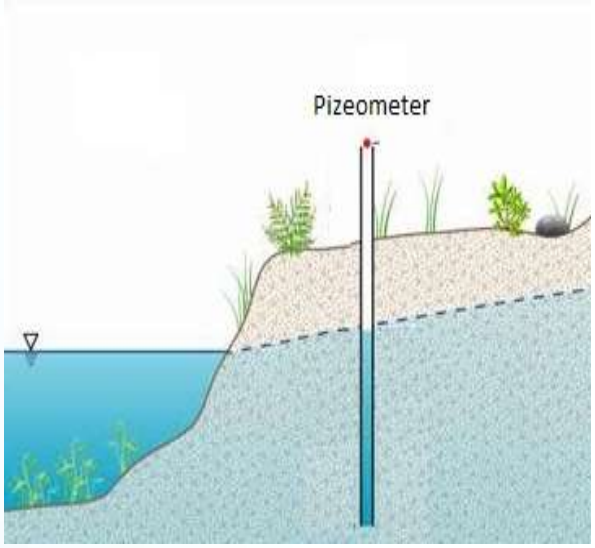
Purpose of Focus Areas

- To evaluate effects from dam operations on resident and anadromous fisheries.

- To sample at higher densities so that prediction in changes of water quality conditions from project operations can be made with a higher degree of resolution.

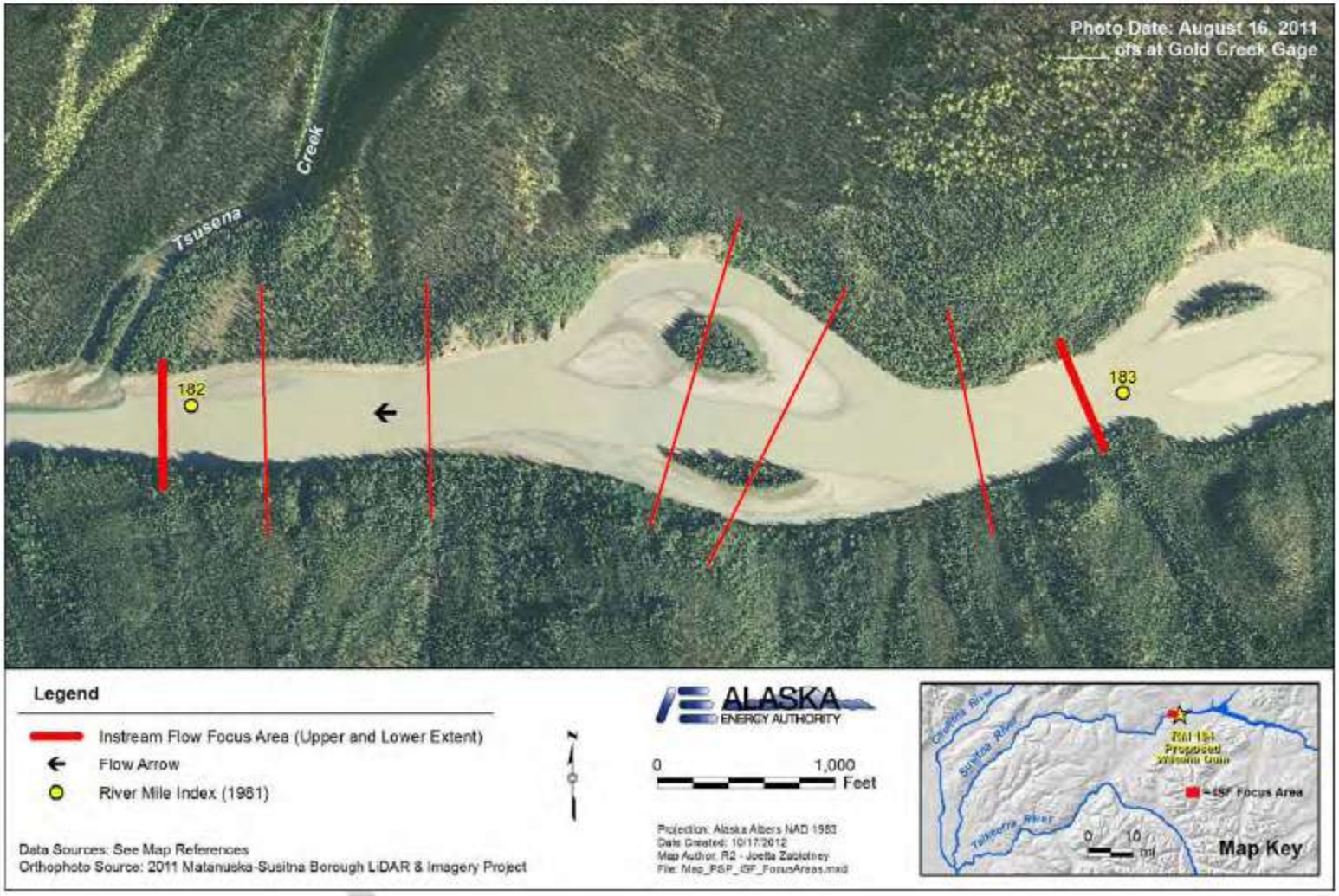
- Parameters measured in focus areas will be used for calibration of the EFDC model.

Baseline Water Quality Monitoring: Focus Areas

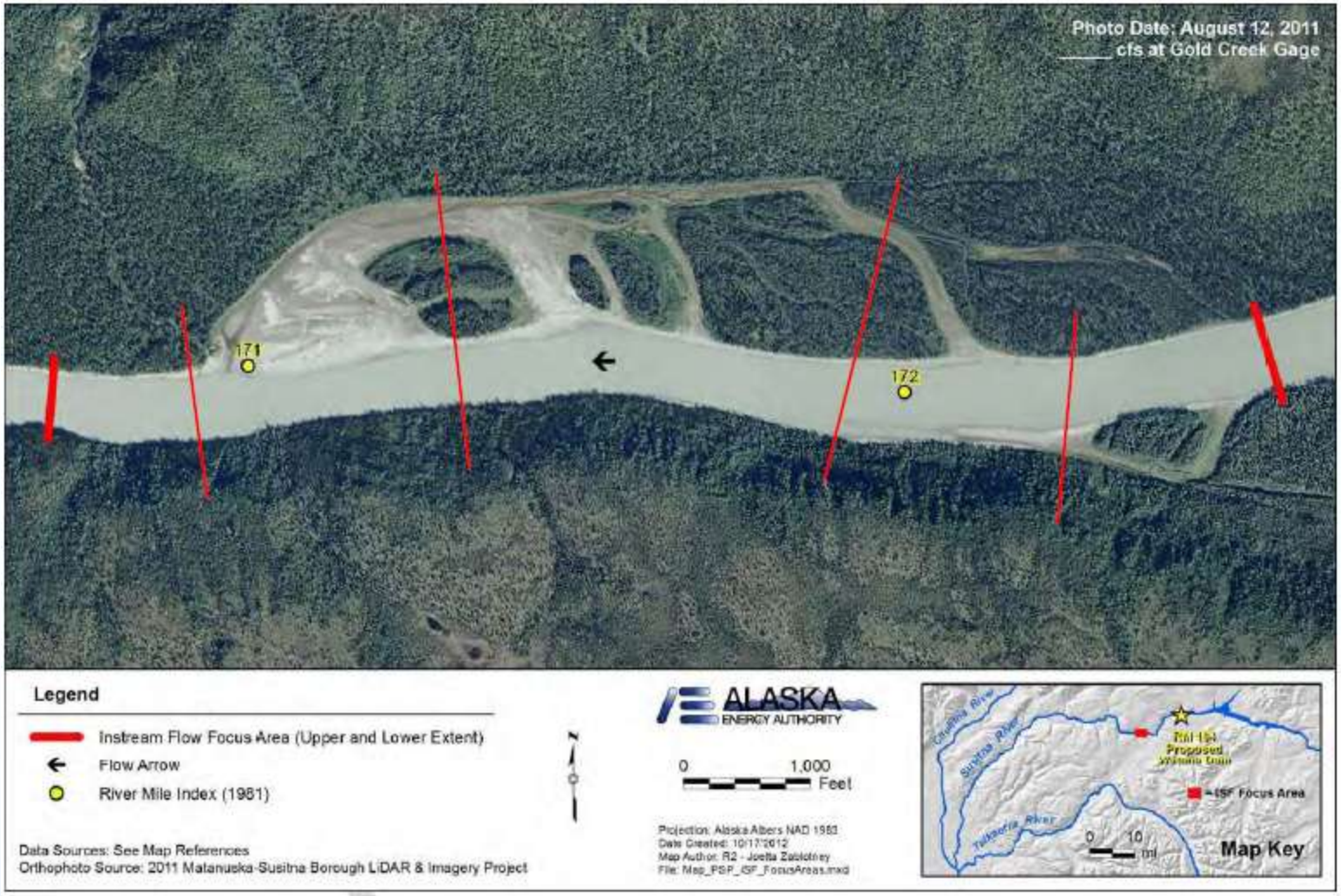


Sampling Location and Frequency

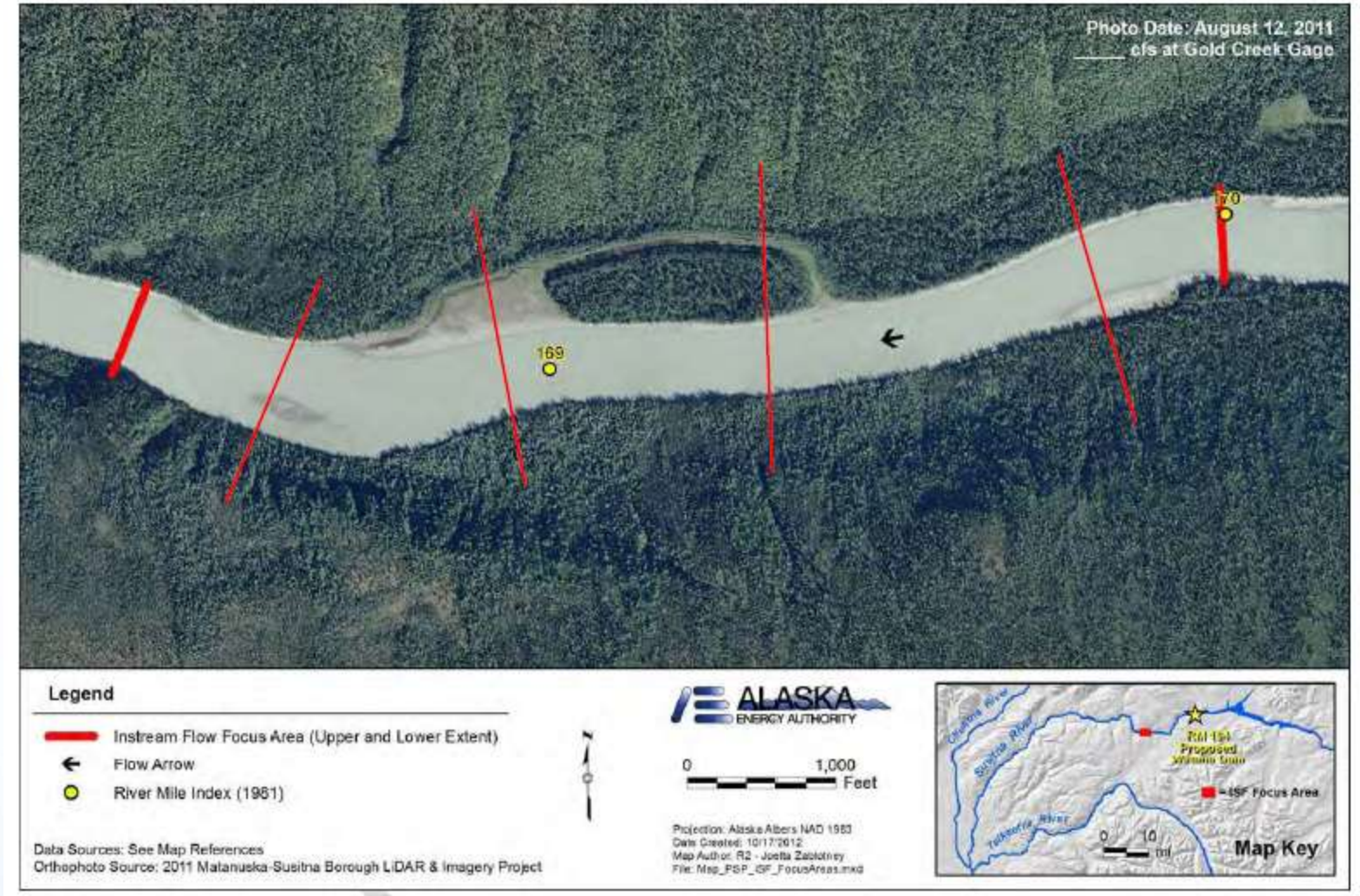
- Transects will be placed every 100m to 500m depending on the length of the focus area.
- Water quality samples will be collected on at least 3 locations along the transects.
- Collection locations along a transect will be in open water and have up to 3-5 collection points.
- Samples will be collected every 2 weeks from June- September.
- Locations of open water transects and piezometers will be coordinated with the instream flow and groundwater studies.



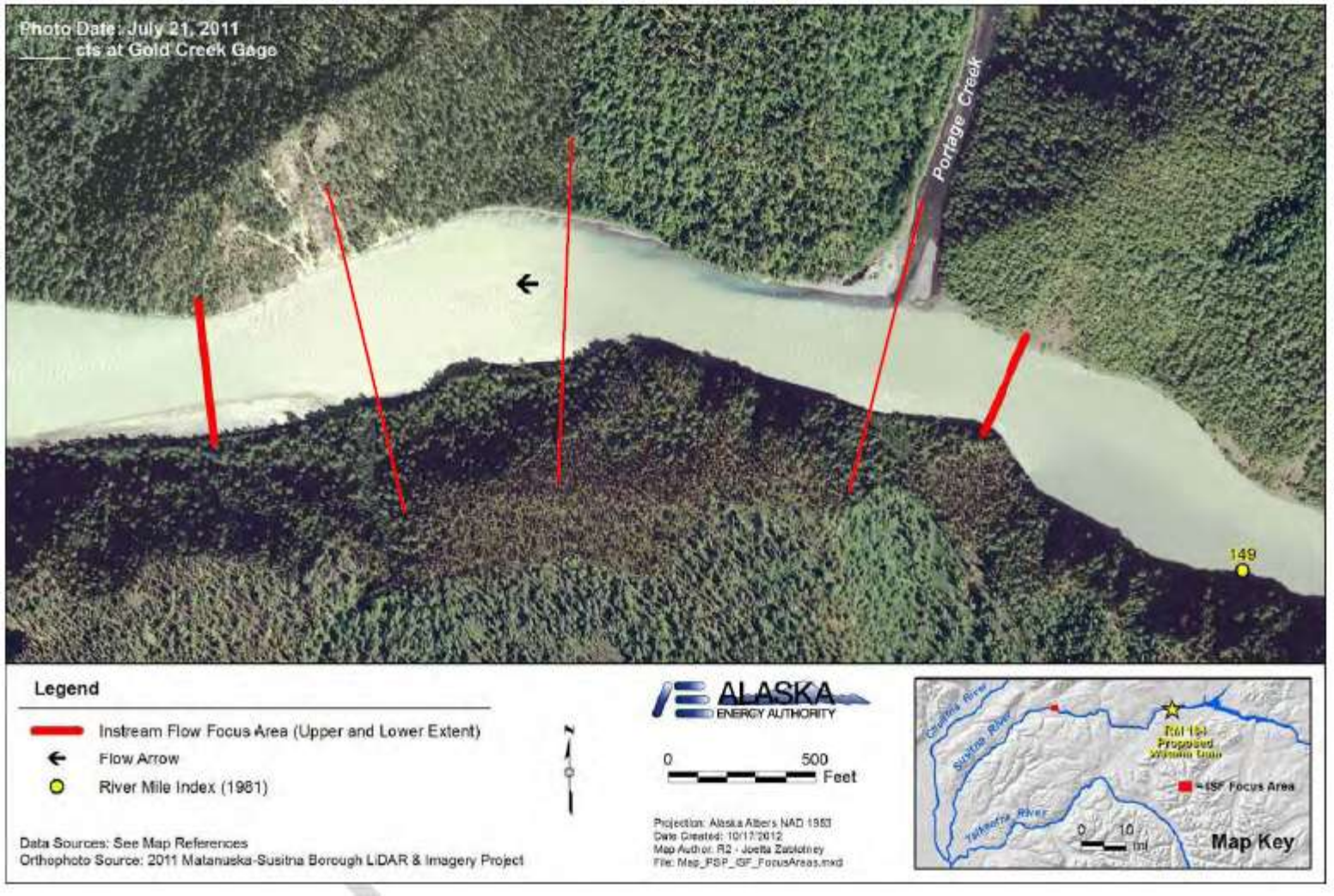
Focus Area 1- Below Dam



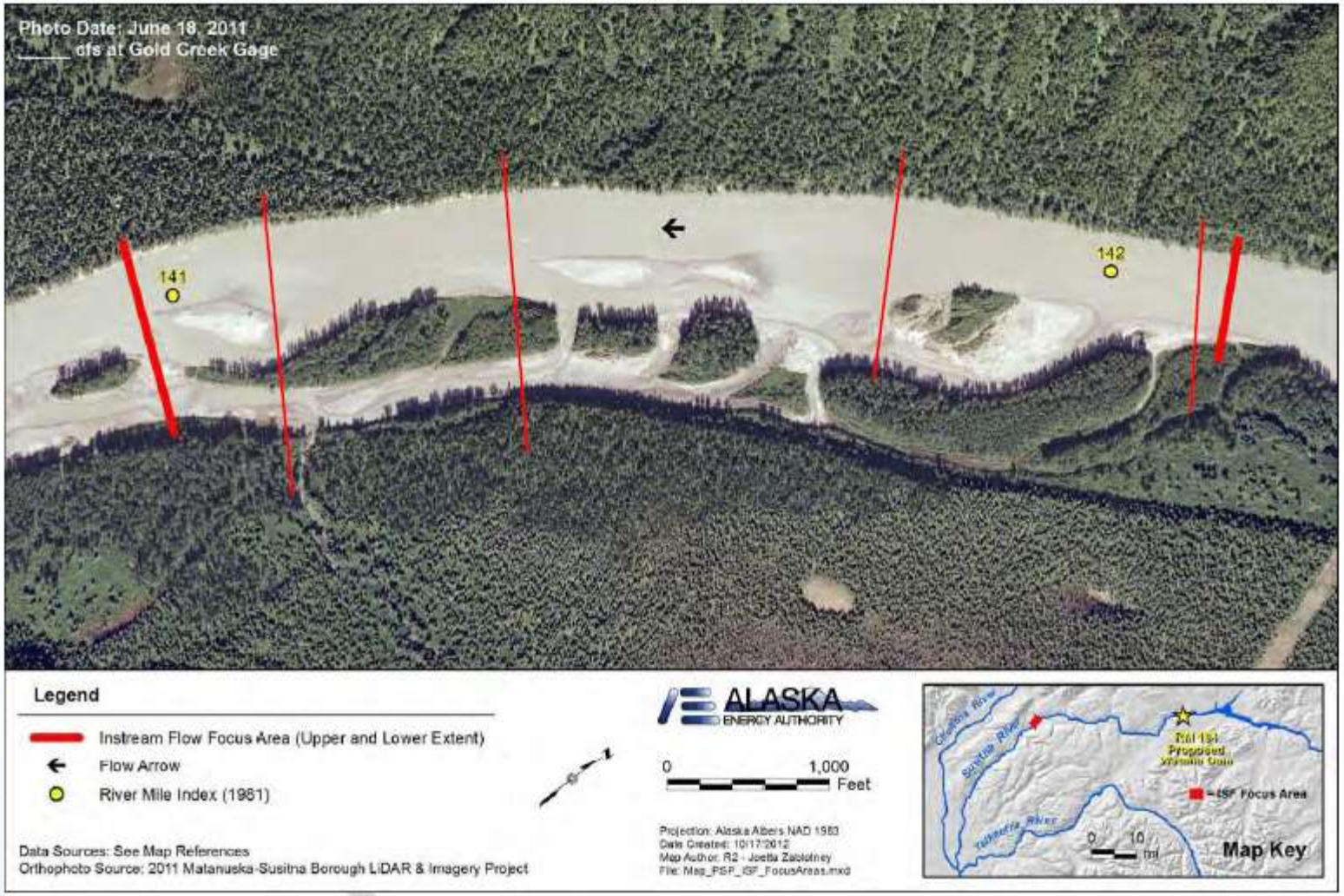
Focus Area 2- MR2 Wide



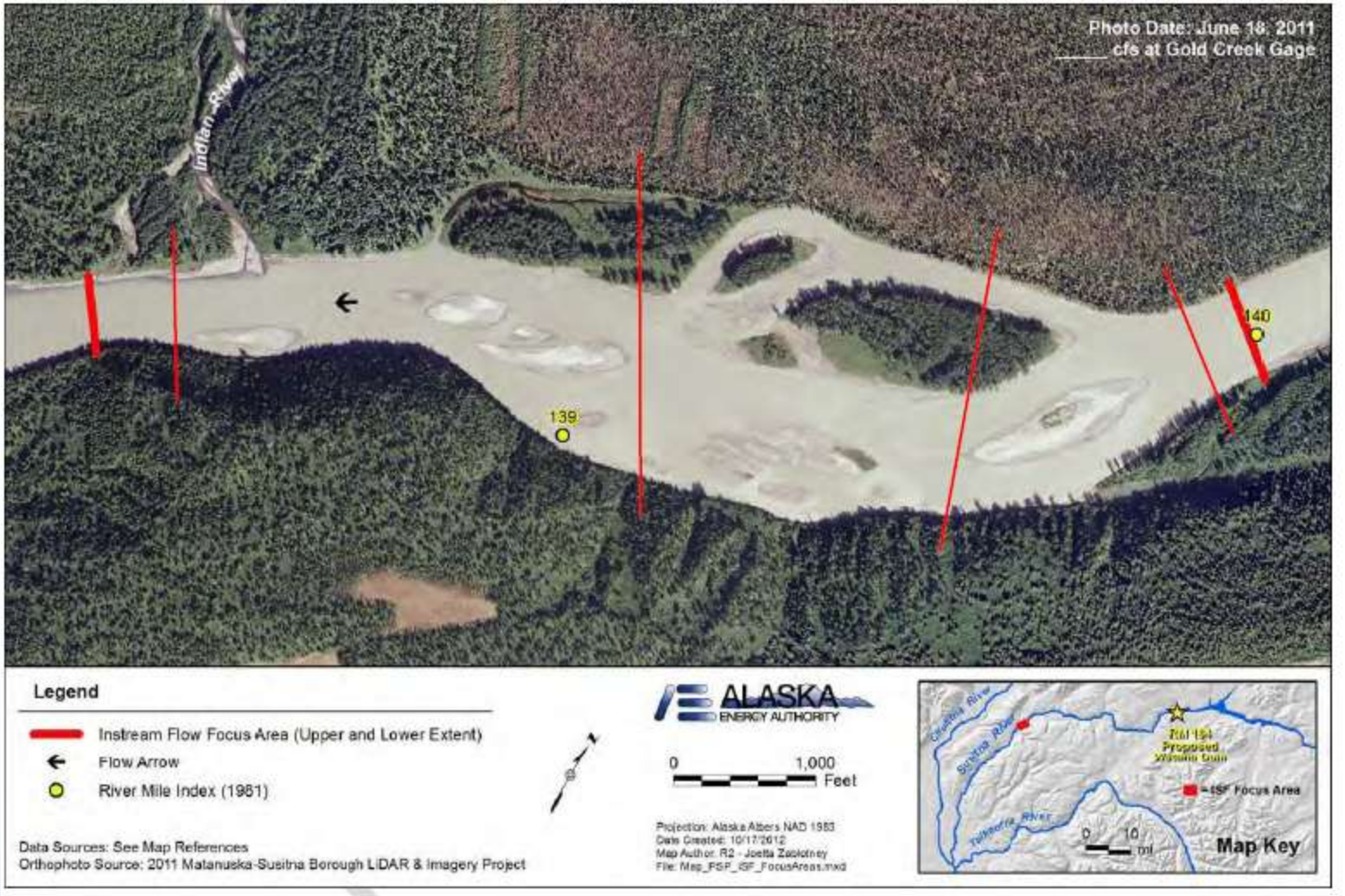
Focus Area 3- MR2 Narrow



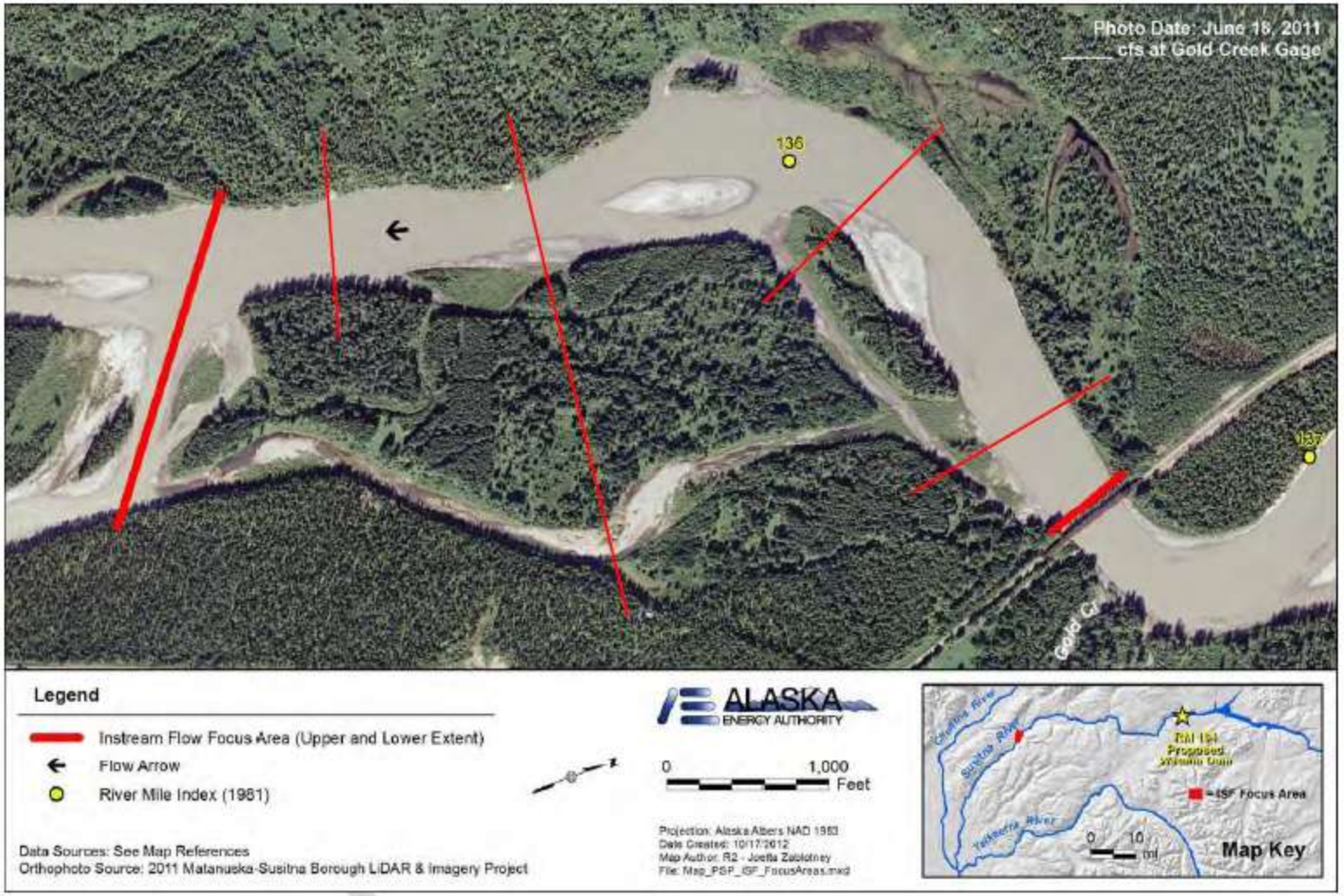
Focus Area 4- Portage Creek



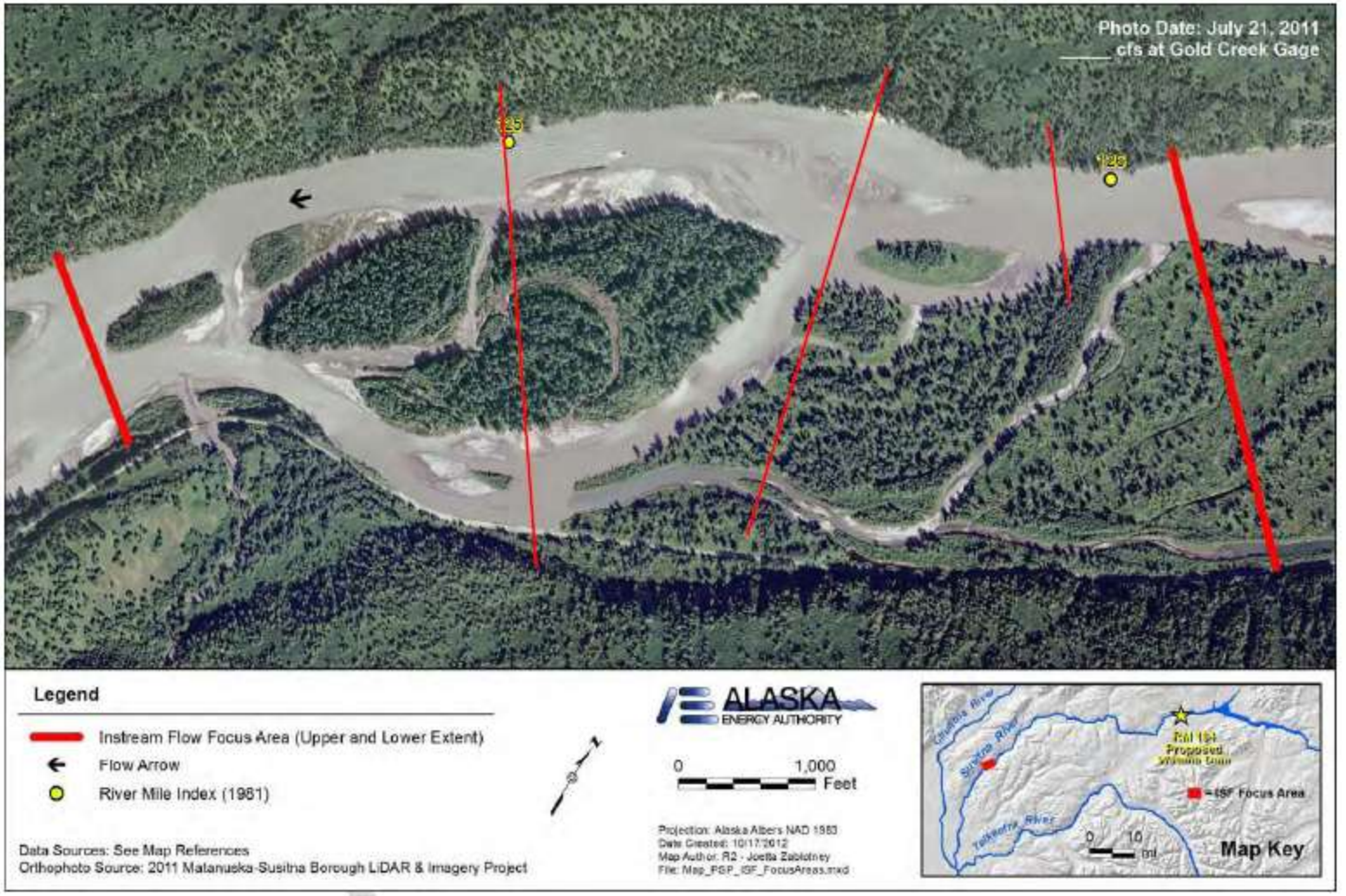
Focus Area 5- Slough 21



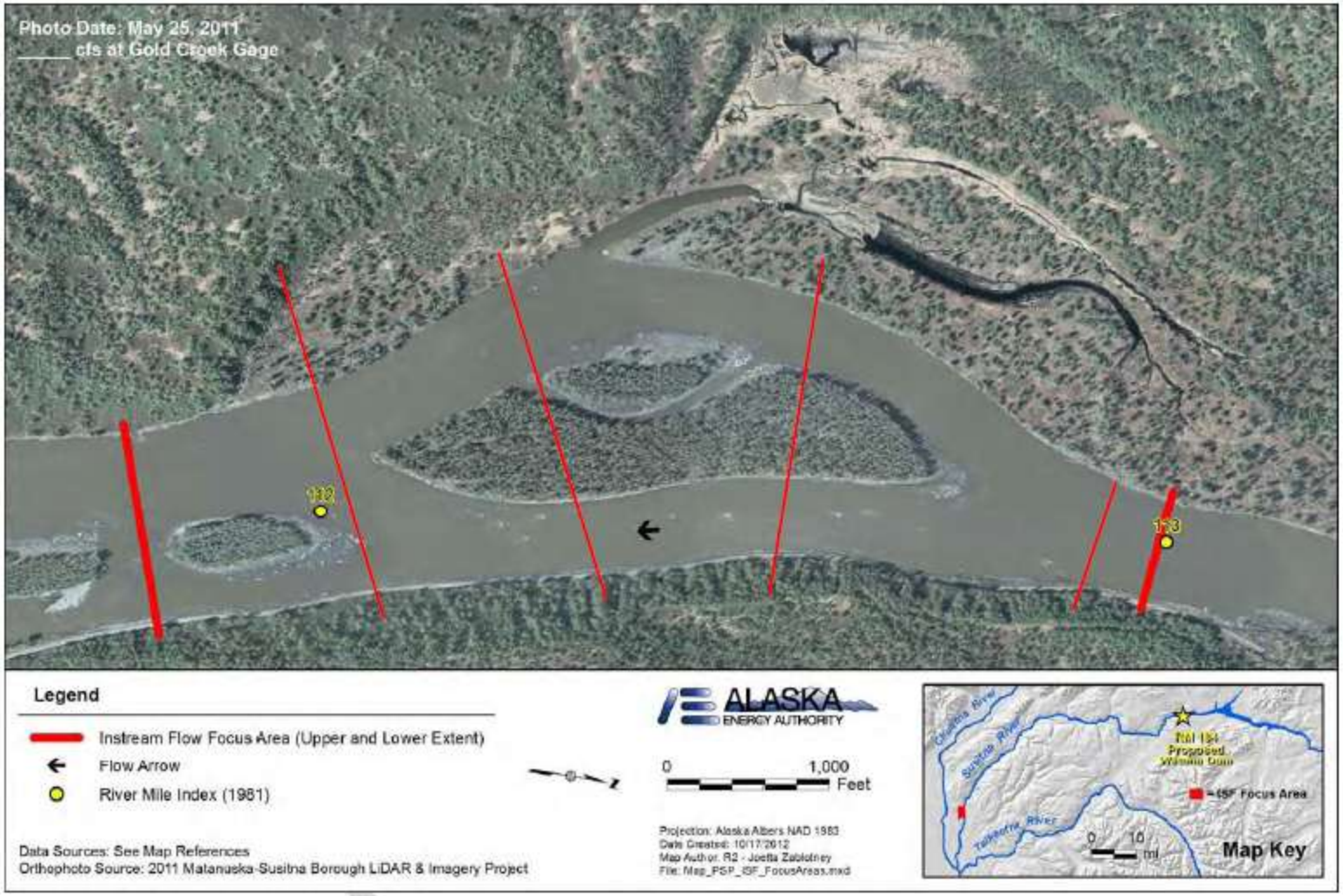
Focus Area 6- Indian River



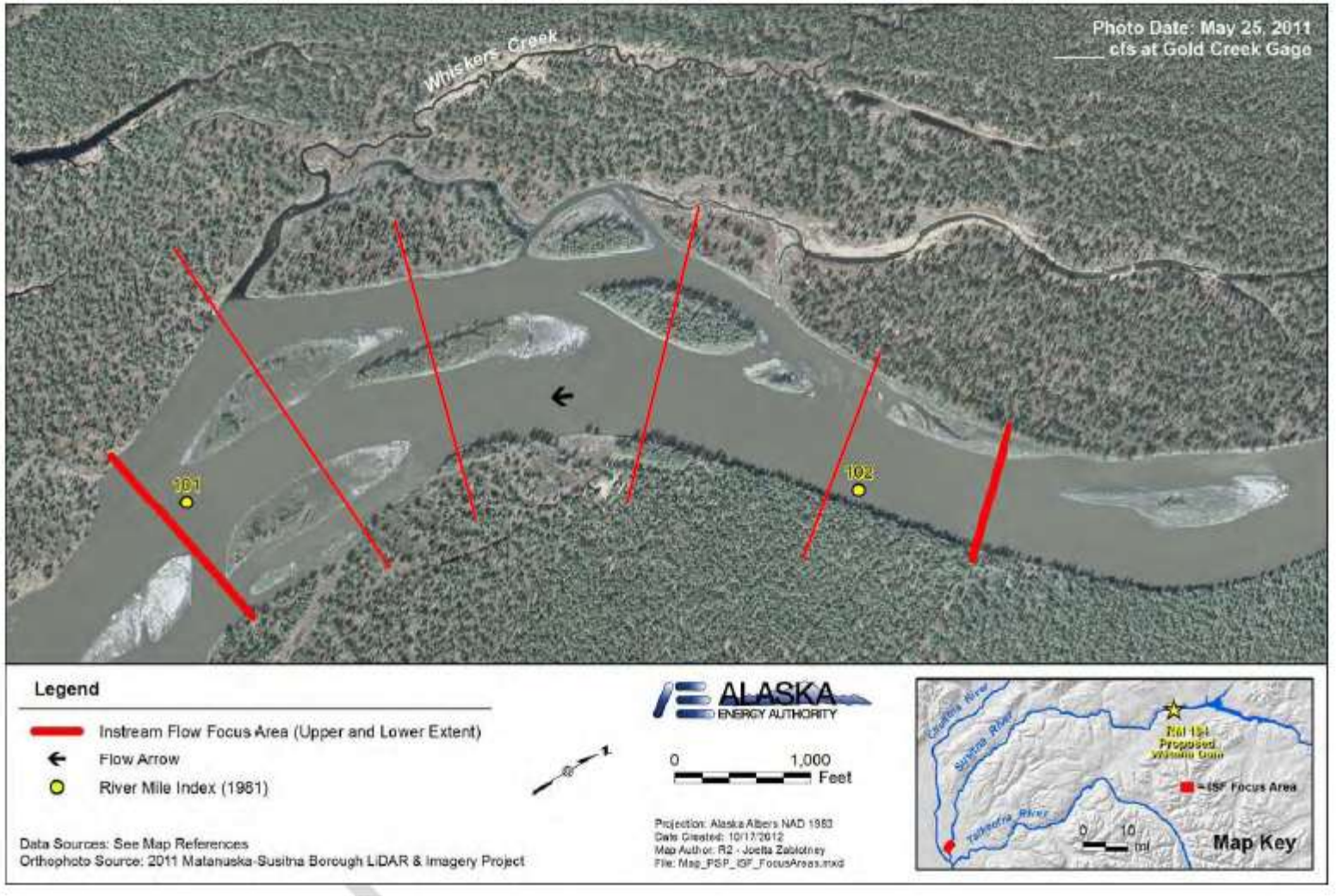
Focus Area 7- Slough 11



Focus Area 8- Slough 8



Focus Area 9- Slough 6A



Focus Area 10- Whiskers Slough

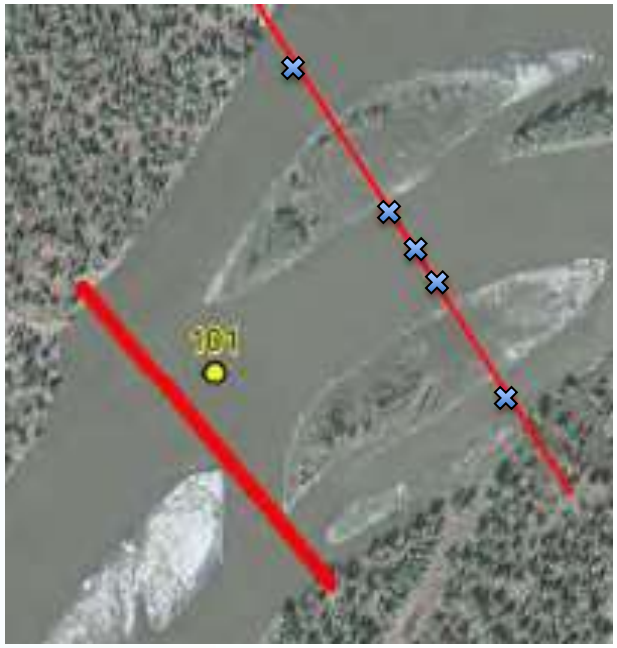
Main Channel Sampling Strategy

- Samples will be taken at 25%, 50% and 75% relative to the river bank across a transect.
- Field parameters measured at each site:
  - Temperature
  - Dissolved Oxygen
  - Conductivity
  - pH
- General chemistry parameters measured at each site:
  - Turbidity
  - Hardness
  - Total Nitrogen
  - Nitrate + Nitrite- Nitrogen
  - Total Phosphorus
  - Soluble Reactive Phosphorus
- Metals measured at each site:
  - Mercury (total)
  - Methylmercury (dissolved)
  - Aluminum (dissolved and total)
  - Iron (dissolved and total)

Sampling a Main Channel and 1 Side Channel

- Samples will be taken at 25%, 50% and 75% relative to the river bank across a transect in the main channel.
- One sample will be taken in the center of the side channel.
- Field parameters measured:
  - Temperature
  - Dissolved Oxygen
  - Conductivity
  - pH
- General chemistry parameters measured:
  - Turbidity
  - Hardness
  - Total Nitrogen
  - Nitrate + Nitrite- Nitrogen
  - Total Phosphorus
  - Soluble Reactive Phosphorus
- Metals measured:
  - Mercury (total)
  - Methylmercury (dissolved)
  - Aluminum (dissolved and total)
  - Iron (dissolved and total)

Sampling a Main Channel and 2 Side Channels



- Samples will be taken at 25%, 50% and 75% relative to the river bank across a transect in the main channel.
- One sample will be taken in the center of each side channel.
- Field parameters measured:
  - Temperature
  - Dissolved Oxygen
  - Conductivity
  - pH
- General chemistry parameters measured:
  - Turbidity
  - Hardness
  - Total Nitrogen
  - Nitrate + Nitrite- Nitrogen
  - Total Phosphorus
  - Soluble Reactive Phosphorus
- Metals measured:
  - Mercury (total)
  - Methylmercury (dissolved)
  - Aluminum (dissolved and total)
  - Iron (dissolved and total)

Sampling in Focus Areas

- **Continuous logging of water quality parameters using multi-parameter probes (Optional at select Focus Areas).**
  - **Temperature**
  - **Dissolved Oxygen**
- Piezometers will be installed so that surface water and groundwater samples are collected at the same time to determine the influence of groundwater on surface water.
- Field parameters measured:
  - Temperature
  - Dissolved Oxygen
  - Conductivity
  - pH
- General chemistry parameters measured:
  - Turbidity
  - Hardness
  - Total Nitrogen
  - Nitrate + Nitrite- Nitrogen
  - Total Phosphorus
  - Soluble Reactive Phosphorus
- Metals measured:
  - Mercury (total)
  - Methylmercury (dissolved)
  - Aluminum (dissolved and total)
  - Iron (dissolved and total)

Continuous temperature monitoring probe