

SUSITNA-WATANA HYDROELECTRIC PROJECT

Fish and Aquatic Resources

RSP 9.8

River Productivity Study

FERC SPD Recommended Consultation:

Stable Isotope Sampling Sites

September 23, 2013

FERC Study Plan Determination:

- **FERC SPD on the River Productivity:**

“We recommend that AEA consult with NMFS and FWS when identifying the appropriate two focus areas for stable isotope sampling, where within the focus areas each type of stable isotope samples would be collected, and the number of adult salmon tissue samples to be collected.”



Stable Isotope Site Consultation

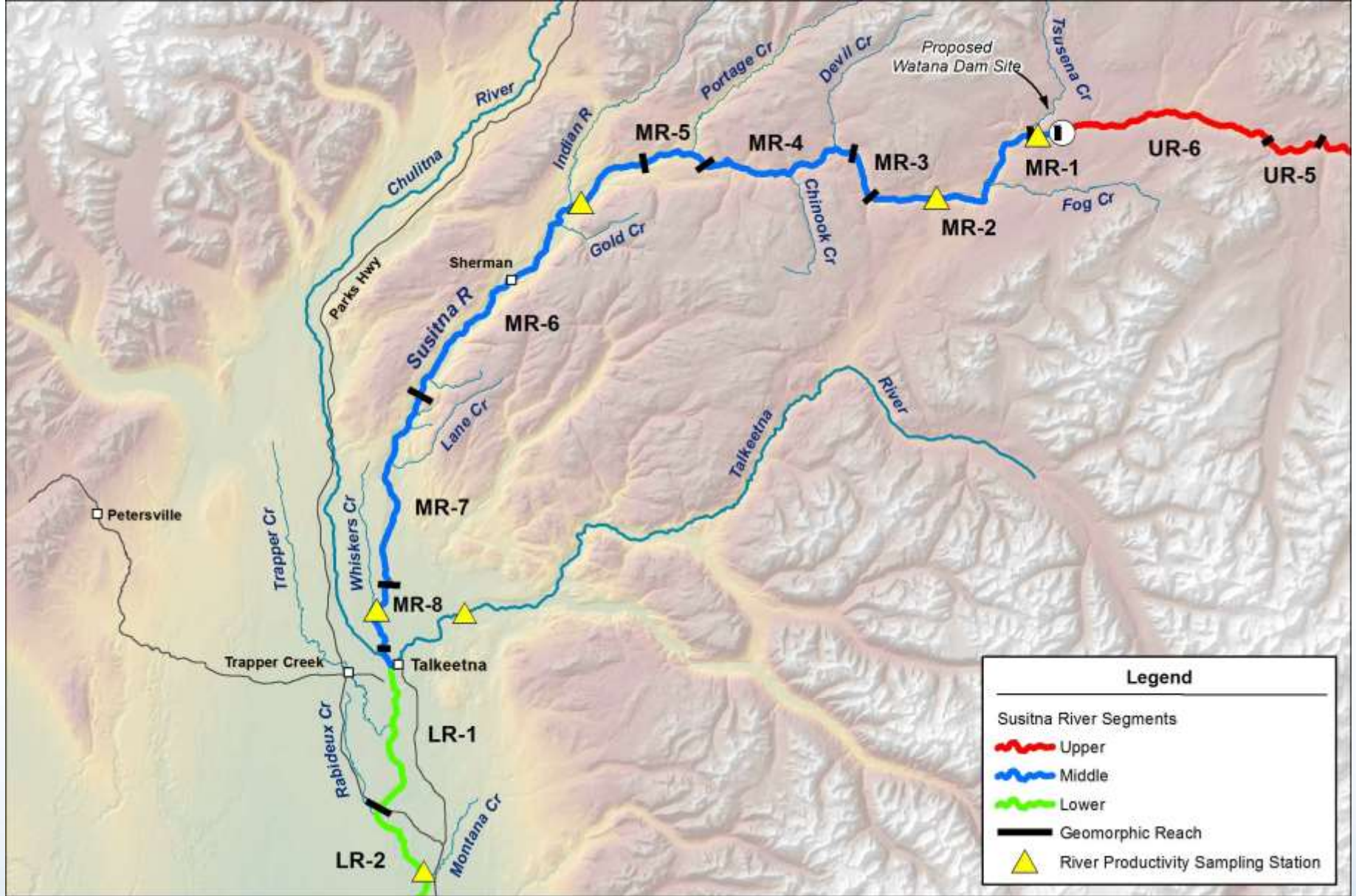
- The implementation plan states: “Isotope samples will be collected from two of the River Productivity Study sampling stations in the Middle Susitna River, with three habitat-specific sampling sites per station, for a total of six sampling sites.”
- From the proposed sites in the Middle Susitna River, FA-104, FA-141, FA-173, and FA-184 were the possible candidates. Only FA-104 and FA-141 are below Devils Canyon. These were selected for isotope sampling.
- As per the FERC SPD recommendation, the number of sample sites increased at each station, for a total of nine sampling sites. Stable isotope samples are collected at each site.



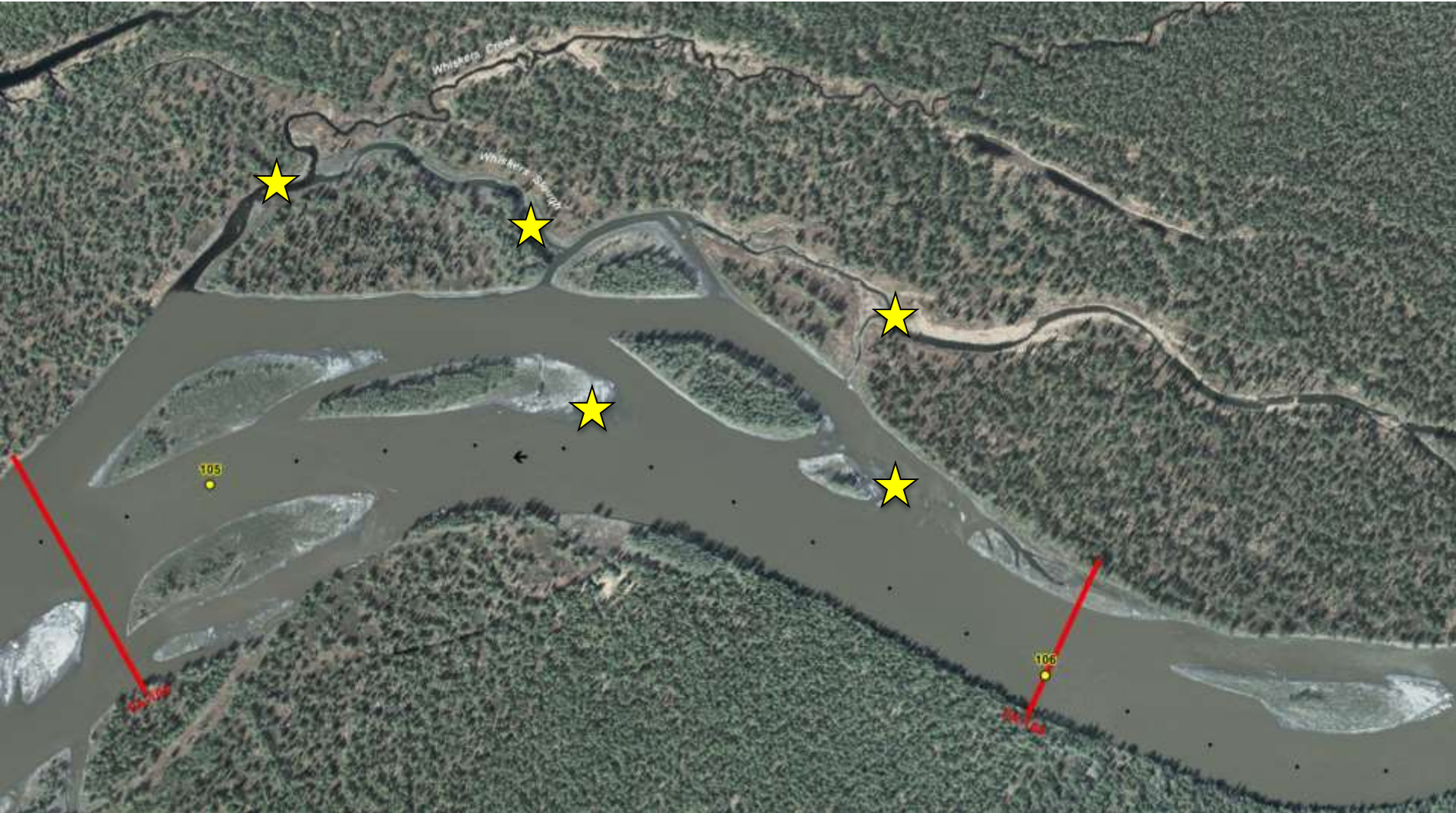
Stable Isotope Site Consultation

- Stable isotope sampling was added at two additional River Productivity stations.
 - Montana Creek station (RP-81), with four sites
 - Watana Dam site (FA-184), with three sites
 - Sampling at these sites is intended to document variation in MDN contribution to nutrients.
- This results in a total number of four stations, with 16 sites, at which stable isotope samples are being collected.





FA-104 (Whiskers) Isotope Sites



FA-141 (Indian River) Isotope Sites



FA-184 (Watana Dam) Isotope Sites



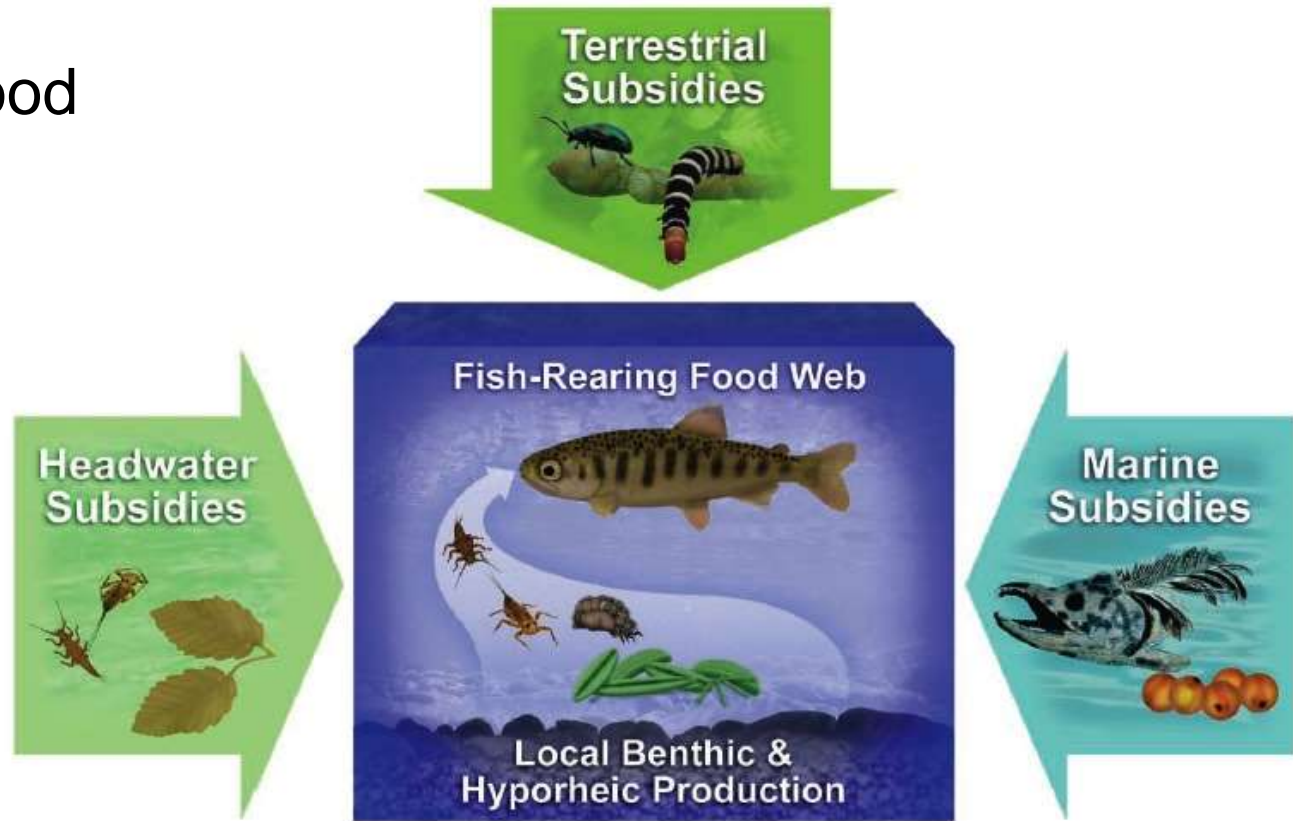
RP-81 (Montana Creek) Isotope Sites



Food resources for juvenile salmonids

Juvenile stream salmonids eat food from a variety of sources:

- Freshwater
 - Local habitat
 - Upstream habitats
- Terrestrial
- Marine

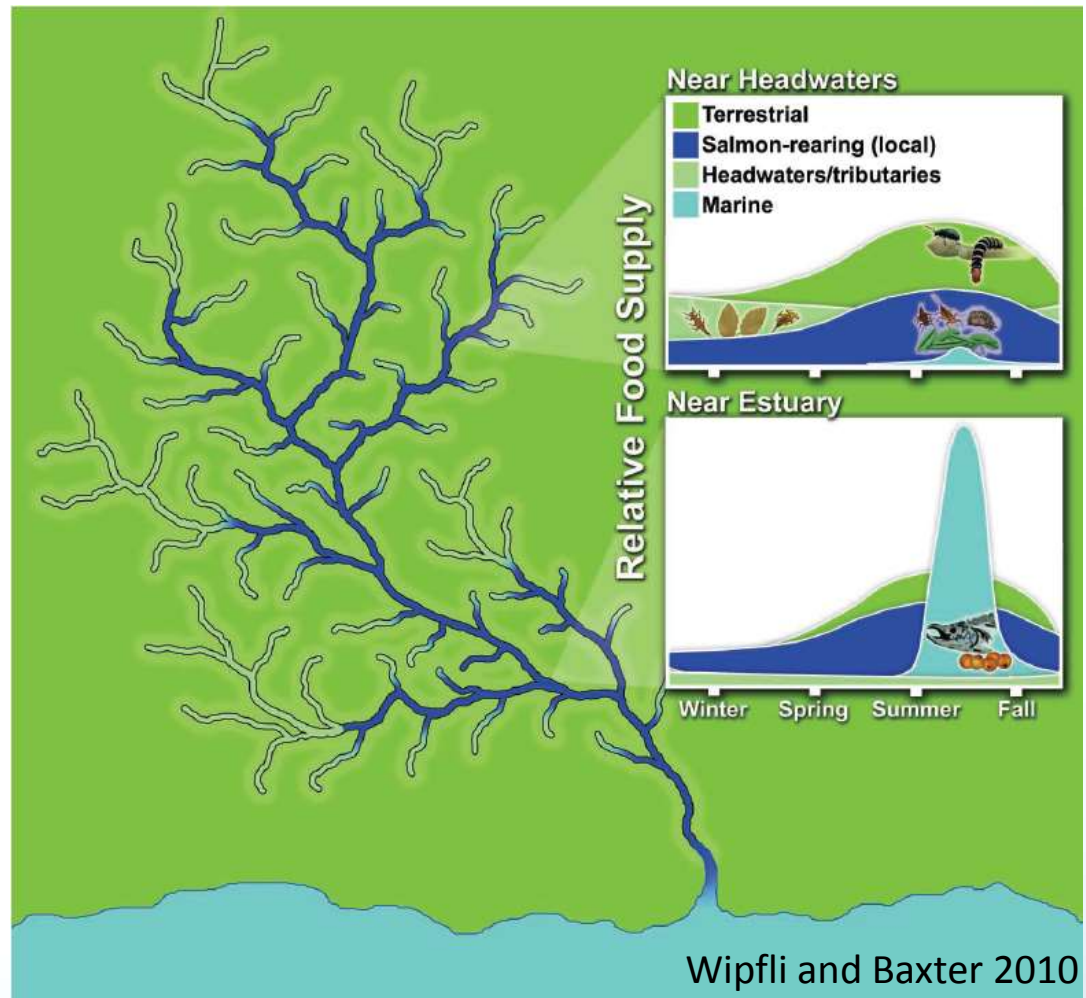


Wipfli and Baxter 2010

Objective: Quantify energy pathways supporting juvenile salmonid production in the Susitna

How do these pathways differ...

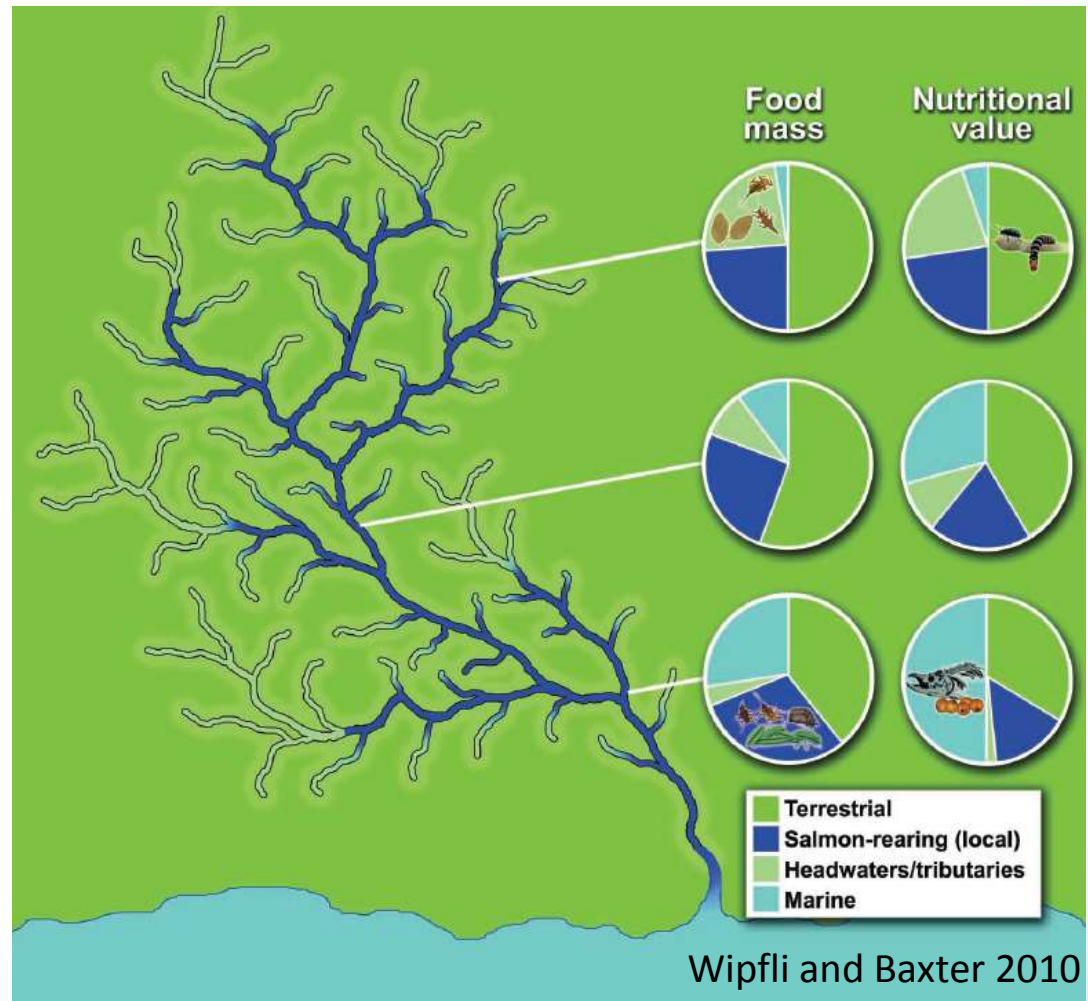
- Between upstream and downstream reaches with different levels of MDN inputs?
- Among habitats within reaches?
- Seasonally?



Objective: Quantify energy pathways supporting juvenile salmonid production in the Susitna

Two complementary approaches are being used to quantify these diet patterns:

- Stomach content analysis
- Stable isotope analysis



Goals for stable isotope sampling sites

1. Sample multiple reaches along an upstream-downstream gradient to include contrasting levels of spawning salmon (MDN) inputs
2. Sample multiple habitat types within each reach
3. Co-locate sampling sites with fish stomach content sampling to collect complementary diet datasets
4. Co-locate sampling sites with related studies (Other River Productivity sampling, Instream Flow, and Fish Distribution and Abundance) as much as possible to integrate datasets and simplify logistics



Stable Isotope Site Consultation

- This design achieves all four goals for site selection. The sampling sites span over 100 river miles, and are expected to include a large range in MDN inputs from upstream above Devils Canyon to downstream in the Lower River.
- By sampling isotopes primarily at Focus Areas, the value of these samples as complementary data to the fish stomach contents and other related datasets is maximized.

