

The Bigger the Fish, the Bigger the Attitude?

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Participant Roles: Keane's main roles include provision and organization of data, supplementation of introduction and conclusion sections of the paper. Morgan and James's main roles include model development, code generation, and analysis implementation. Ronny's main roles include supplementation of the methods and results section of the paper. While specific roles are assigned, all project roles will be contributed to fairly and equally by all group members.

Brief Background: The data collected for this project originated from a research project carried out by Mary Power's lab at UC Berkeley in a BACI study looking at the effects of positive flow augmentation on juvenile salmonid foraging behavior in an intermittent, losing stream in Sonoma County, CA. The study design resulted in 3 sites above and below the point of treatment in the river. In each site, we placed an in-situ stereo camera setup to capture behavioral observations of juvenile Steelhead trout (*Oncorhynchus mykiss*) and Coho salmon (*Oncorhynchus kisutch*) at the head of each pool. Cameras recorded 45 minute intervals during each of these sampling periods, capturing the foraging and inter/intraspecies behavior of all visible fish species.

Research Questions: We wish to investigate the relationships between foraging behavior of Steelhead and numerous environmental and physiological factors. One question we aim to answer; does size have an effect on foraging behavior of Steelhead? We hypothesize that length of individuals will have the largest effect on foraging behavior in both treatment and non-treatment sites.

Primary/Ancillary Data: The resulting videos from each sample were run through a novel videogrammetry software called [VidSync](#), which allows for camera calibration to calculate object position in relative space. Once calibrated, each video was broken up into six randomly chosen 30-second subsamples with ten 3-second observations for each observed individual per subsample in which an X, Y, Z position, 3-second behavioral observation, and timecode was given for each datum. The resulting .csv files are able to be manipulated into retrieving a variety of metrics such as nearest neighbor distance, swimming speeds, water column position, volume occupied, etc.

Anticipated Analytical Approach: For our analysis, we intend to use hierarchical bayesian inference to investigate possible relationships between foraging behavior and variables. A bernoulli distribution used to estimate each behavior with a deterministic regression for the probability of the event and a logit value for the probability of the event will be used in Markov chain Monte Carlo (MCMC) iterations to obtain posterior distributions for Steelhead foraging behavior given parameters of interest. Bayesian credible intervals for the mean of the posterior distributions will be used for inference. Software used to run analyses will either be program R or JAGS.