

Research Questions

This set of questions was generated by the Oregon Watershed Enhancement Board's Coho monitoring team. Contact information for people in Corvallis who are working on these questions is given in square brackets.

Estimation of status and trend in condition using probability survey data.

Rotating panels in conjunction with spatially balanced annual samples are being used in Oregon to monitor coho salmon populations. How can the sampling design be used to estimate status and trend of coho habitat and population totals? [Kara Anlauf (Kara.Anlauf@oregonstate.edu), Bill Gaeuman (wgaeuman@science.oregonstate.edu)]

Spatial patterns in fish populations can be characterized in several ways: Expansion/contraction of range, proportion of occupied sites, patterns of relative abundance. What are some reasonable metrics or indicators characterizing spatial pattern? Can we improve the usual kriging-based characterization of spatial patterns? [Stevens (stevens@stat.orst.edu)]

How might existing survey designs be improved to facilitate estimation of status and trend?

Modeling linkages between landscape conditions, instream habitat, and biological response

We have used landscape conditions to predict the distribution of adult spawners for both the index sites [Julie Firman (julie.firman@oregonstate.edu)] and the probability sampled sites (Steel). We are now focusing on linking landscape indicators and instream habitat conditions [Kara Anlauf (Kara.Anlauf@oregonstate.edu)], and applying these relationships to understand the distribution of juvenile salmonids (Burnett). Landscape data is often geographically misaligned with habitat data. How can this misalignment be included in the model?

How can relationships between habitat characteristics be detected?

The spatial distribution of fish is often clustered. What improvement might be gained by incorporating adaptive sampling into the GRTS design? What are some new and innovative techniques to sample highly clustered populations? [Bill Gaeuman (wgaeuman@science.oregonstate.edu), Don Stevens (stevens@stat.orst.edu)]

Coho data indicate extremely skewed abundance distributions with many sites with no fish. Might the use of zero inflated negative binomial/Poisson or other methods improve estimates of status and trend in abundance? [Lisa Madsen (madsenl@onid.orst.edu)]

Would application of network topology (i.e. stream distance vs. Euclidean distance) improve various measures of spatial pattern, spatial correlation?

Developing procedures for combining probability survey data with non-probability survey data to estimate population characteristics

Historically, many aquatic monitoring programs were based on ad hoc or convenience-based site-selection procedures, or surveying index sites. The research focus in this area is to develop useful guidelines for determining the utility and practicality of combining probability and non-probability data and to investigate ways of extending existing techniques. Contact Julie Firman (julie.firman@oregonstate.edu) for index site data.