

Stock Assessment Workshop

Dec 11-15 2001

Purpose:

- To familiarize fisheries workers with stock assessment methods and principles
- To evaluate summer and historic data within stock assessment framework
- To use these data to reflect on monitoring methods and needs

What Is Stock Assessment/stock Synthesis?

Stock assessment is a method that uses population dynamic principles (mortality, life-span, time at maturity) in an accounting framework to evaluate population change over time.

Assumptions for Native Fish (HBC):

- Long-lived species.
- Spawning effort is not the same in all years.
- Mortality is greatest from 0 to age 1.
- Earliest meaningful data is from year 1+.
- Size/age information indicate that fish 90 mm or greater are at least 1 year old.
- Fish growth/age relationships get clouded beyond 200 mm due to LCR/mainstem influences. So difficult to distinguish age 3 fish from older fish.

What do data show?

1. Gear-type calibration.

Trammel nets/ Hoop nets – coefficient of variation is large dependent on location. Favors native fish, but cannot use to estimate densities of fish/fishing effort. Can use it in mark/recapture methods for recruitment, population change.

Electrofishing – coefficient of variation becomes smaller with increased sampling effort. Favors trout, can use as a method to estimate trout numbers.

Methods for Monitoring.

Native fish.

Mark/recapture.

Because spatial distribution changes by season and gears cannot be calibrated to provide confident estimates for fish numbers, mark/recapture appears to be the best method to get a handle on native fish population numbers.

Implications for Management

- Smallest size for PIT tagging is 100-120mm range.
- This is year one to 18 months after spawning.
- Earliest can begin to see recruitment into adult population is two years.
- Two – three year lag time associated with any single year experiment similar pattern seen in L.F trout model.

Methods for Monitoring

Trout

CPE density/population estimates.

Electrofishing works well for estimating trout densities. Combined with L.F. Work will likely give good predictor/estimator of change in rainbow/brown trout populations.

Methods for Monitoring.

Small bodied exotics

Seining primary gear-type for these fish.

Cannot effectively calibrate as these are biased gear types, like trammel nets and hoop nets. At best we can only get relative abundance and distribution information for these fish. Not likely to get population estimates for them.

Methods for Monitoring.

Other fish (carp, catfish)

Electroshocking and netting.

Harder to determine unless numbers increase which a general survey effort would serve to keep tabs on.

Implications for Management Strategies

- Need for consistent yearly sampling efforts.
- Yearly stock assessment reports and analysis. These reports would reflect events that may have contributed to changes in recruitment 2 years earlier.
- Can eventually be used for predictive/validation models provided assumptions are correct, or feedback into assumptions of model/idea of grand canyon fish.

Monitoring Efforts for This Year

- Priority to re-establish mark/recapture effort for humpback chub.
- 4 LCR trips, 3 mainstem trips (1 trout, 2 HBC/native fish efforts).
- Completion of historic data base for analysis.
- Initiation of stock assessment spreadsheet development for grand canyon fish.