Flat panel resistivity counter undercounts steelhead in a low conductivity stream

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Context

ADF&G needs to develop a reliable counting method for remote streams to monitor steelhead abundance without impeding migration.

Background

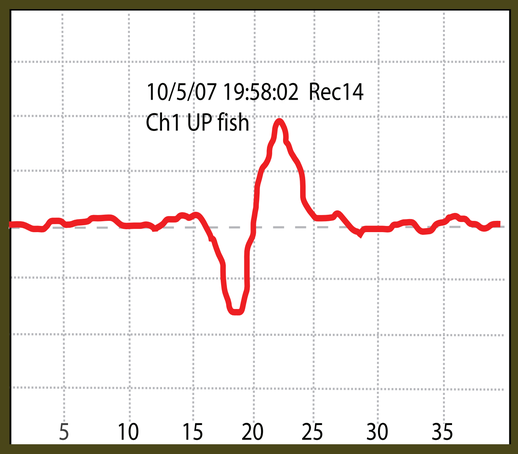
- The drop in bulk resistance as a fish swims over the panel electrodes is measured by the counter as a signature.[2]
- The counter uses an algorithm to determine fish size and direction from the signature.[2]

Summary

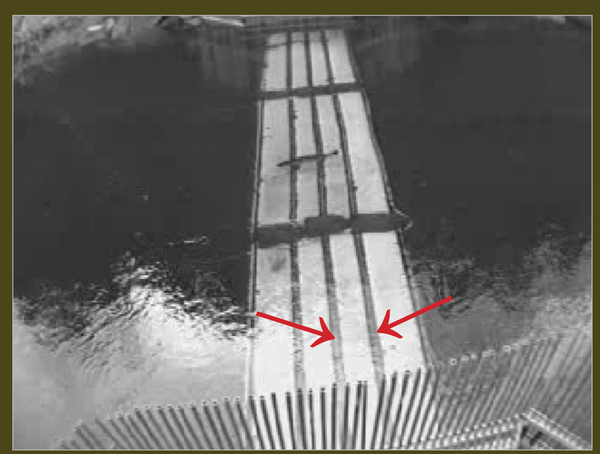
- Counter undercounted steelhead overall
- Likely culprit: very low conductivity (8.8 µs/cm)
- Unable to assess kelt migration
- Unable to predict length of non-videoed steelhead
- Used a ratio estimator to expand counts for abundance estimate

[1] Panels in Peterson Creek

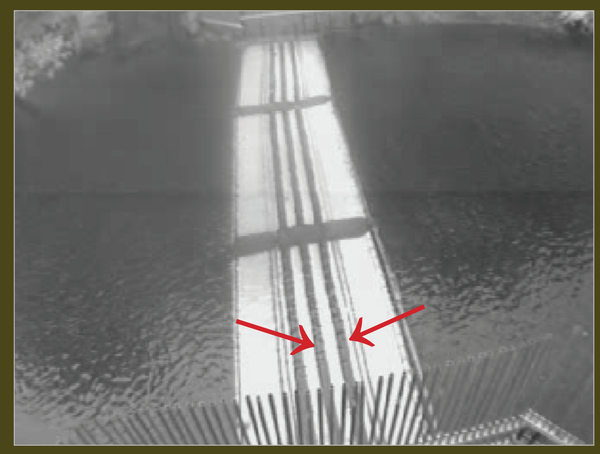
[2] Fish Signature from Counter



[3] 32 cm Electrode Spacing



[4] 20 cm Electrode Spacing



Methods

- Panels and Logie 2100C resistivity counter were installed in a stable reach in Peterson Creek. Upstream fish were classified as an unknown event.[1]
- Tested counter with video validation for 5 weeks.

Results

Video validation revealed misclassification of fish moving both upstream and downstream:

- 45.9% upstream fish correctly classified
- 54.1% downstream fish correctly classified
- Only 30% of the upstream fish were accounted for moving downstream
- Most common error—

  upstream fish were classified as an unknown event.

Recommendations for 2008

Change electrode spacing from 32 cm to 20 cm [3, 4] to amplify the signature.

For more information:
www.sf.adfg.state.ak.us/Region1/trout/peterson.cfm