Pink notes

**1957-85 IPSFC mark recap cv=0.2**

-Generated for virtually all spawning areas including those where less than 1,000 Pink Salmon typically spawned.

-Mark-recap in 5 big systems, low precision estimates (peak live + dead \*correction\_factor) in smaller systems, but about 92% of the stock was estimated with M-R.

-Andrew and Webb (1987a) found that a) there was only estimates where precession could be estimated and b) there was some double counting of estimates where things were independent or part of a group.

-For escapement estimates based on complete counts of live or dead fish (fence count), a CV of 5% was assumed. For estimates based on the peak live count + cumulative dead visual survey method, the CV was related to the number of surveys conducted. If there was only a single survey, the CV was assumed to be 39%. If there were multiple surveys, the inverse of the square root of the number of surveys was subtracted from 39% (or 0.39, p.63).

-In 1957-61 tagging and recovery efforts were considered insufficient to meet the assumptions of the Petersen mark-recapture method. Beginning in 1963, tagging and recovery efforts were increased and, in the lower Fraser River mainstem program, the number of tags applied was adjusted in the Peterson mark-recapture escapement calculation by subtracting tags lost: this included 1) an assumed 5% tag loss; 2) tagged adults caught by in-river fisheries upstream of Duncan Bar; 3) an estimate of tags lost to migration of tagged adults into tributaries (Hourston et al. 1965). Andrew and Webb considered the 5% tag loss factor of Mission-applied tags to be the single largest source of consistent bias in the escapement estimate. A subsequent study by Cass et al. (1995) used data from 1993 (double tagging fish with Petersen disk tags and cinch up tags), and identified a tag loss rate of 4.2%. 5% CV on fences. For visual surveys large streams with relatively large Pink Salmon populations were surveyed multiple (4 to 7) times, while smaller streams with smaller populations were surveyed opportunistically, sometimes only once-per-season (Andrew & Webb 1987a).

-Peak live count was added to cumulative spawners then multiplied by 2.6. 2.6 was based on a single study in 1957! A similar study found an expansion factor of 5.2.

**1987-91 DFO mark recap cv=0.2**

"general consistency" with 57-85 methods. Review and assumption testing in 1987 by DFO.

**1993-01 DFO mark recap in mainstem cv=0.2**

-Total (estimated downstream) and net escapement (total minus upstream catch) estimates.

-Tagging in mission via beach seine. Carcass recovery in lower mainstem (Chilliwack-Vedder River confluence to Ruby Creek in the Fraser Canyon). Live recapture 22km upstream from tagging site.

-Stopped doing a mainstem carcass survey in 97 because it wasn’t representative; problems with recovery and observer efficiency.

**2003-07 PSC purse seine test fishery cv=0.5**

-The subtraction of all catches from the total run size resulted in an estimate of net escapement to the Fraser River that is analogous to the net escapement estimates derived from other methods in prior and subsequent years.

-Because the method involved no direct assessment of the abundance of Pink Salmon in the Fraser River, estimates in these years (2003-2007) are qualitatively different from previous years’ (1957 to 2001) and subsequent years’ (2009 to present) escapement estimates that were directly assessed by either mark-recapture or hydroacoustic programs conducted in the Fraser River.

-The average daily CPUE divided by an estimate of the average historical catchability for each test fishery was used to estimate the daily abundances for the duration of the Pink Salmon migration.

-Interannual variation in catchability is the largest source of uncertainty in the Fraser Pink run size estimate for these years

**2009-11 mission post season cv=0.35**

-PSC runs hydroacoustic estimates to get total escapement. Then in river catch is subtracted from this.

-There was acoustic estimates back to ’77 but advancements in tech didn’t make them reliable till 09. Pre 2009 estimates were underestimates because they didn’t pick up on the nearshore migrating pinks. 2009 did 2 split beam didson and a mobile split beam sounder. Some difficulties in separating out which salmon are pinks, used proportion caught in whonnock test fishery, expert judgement, or proportion in PSC test fisheries.

**2013-2021 mission in-season cv=0.35 (notes from PSC report)**

**-**2015 was first year of in season pink

-79% of pinks are picked up on left bank split beam. Right bank split beam gets 11% and mobile gets 10%.

-same species composition as previous studies? (sec 1.4.3 says they haven’t updated because outside scope of project).