

Pilot Station Exploratory Testfishing

R&M# 09-10

Project Proponent: Bruce McIntosh, Alaska Dept. of Fish and Game – Commercial Fisheries Division, 1300 College Rd., Fairbanks, AK 99701, bruce.mcintosh@alaska.gov

Project Partners: Current partners in the project include the Association of Village Council Presidents (AVCP) and USFWS, who work together to provide a fisheries technician.

1. Introduction:

Objectives:

The primary objective of this project was to increase the accuracy of salmon passage estimates generated at the Pilot Station sonar project by investigating and modifying the current testfishing protocols. This proposal addresses the following priorities:

Assess and achieve fishery management objectives

2. Identify stock composition of salmon runs through genetic stock identification.
3. Improve in-season run size and stock specific estimates at the mouth of the Yukon River.
6. Refine in-season border passage assessment/estimates.

Summary:

This project employs sonar equipment and a gillnet testfishery on the Yukon River mainstem to generate timely, in-season passage estimates of Chinook, summer and fall chum, and coho salmon, which includes fish bound for Canadian waters. Located approximately 123 miles from the mouth of the Yukon River, it is scheduled to operate continuously from approximately June 1 through September 7.

Passage estimates are generated daily by this project, using a combination of hydroacoustics to detect fish targets, and testfishing with drift gillnets to apportion those estimates to species. A suite of gillnets of varying mesh sizes is fished twice daily in the vicinity of the sonar transducers, with sonar sampling and testfishing periods alternating throughout the day (Table 1). The nets vary from 2.75” to 8.5” stretch mesh size to capture all sizes of fish detected by the sonar. Although the nets vary in mesh size, the dimensions of the nets are held consistent among the differing meshes so that the same volume of water is swept by the net on a drift, independent of the mesh. Currently all nets are built to 25 fathoms in length.

Concerns that Chinook salmon may be underrepresented in our estimates have arisen in recent years, with speculation that the relatively larger Chinook may either be less susceptible to capture due to net avoidance, or are migrating further offshore than other species and beyond the end of the nets altogether. Since the apportionment method relies on relative abundance of each species in the catch of each net, simply targeting the Chinook separately from other species will not improve our estimates. In 2009, ADF&G contracted with a local commercial fisherman to compare catches between his 8.5” mesh, 50 fathom long net and the project’s 25 fathom net. The nets were fished in the same area, from the same boat, in alternating drifts. The preliminary results from this informal study showed much higher Chinook CPUE in the 50 fathom net. Based on these results, along with local knowledge, we proposed fishing an alternative set of 50 fathom nets on a daily basis during the month of June to compare the results with those of our standard suite

To apportion sonar estimates to species a suite of gillnets, 25 fathoms long and ranging from 2.75" to 8.5" mesh size, has been fished daily since 1995 (Table 2). Tentative results from 2009 and previous seasons indicate that current net sizes and fishing stations may not be adequate to characterize the runs. In 2010 ADF&G purchased new nets matched to our current suite, but 50 fathoms in length. This project provided funding to cover additional expenses associated with fishing these nets in conjunction with our regular nets.

Beginning with the arrival of the first Chinook salmon on June 9, we began fishing both the full 25 fathom and 50 fathom gillnet suites each day (Table 3). This necessitated fishing all 6 mesh sizes each period, alternating the suite lengths between period 1 and period 2 according to the calendar day (Figure 1). By fishing all 6 mesh sizes each period, rather than 4, we effectively increased our effort by 50%. The fishing periods (normally 3 hours long) required 4.5 to 5 hours on average to complete. We continued to fish this schedule each day through June 23, when it was determined that the extended fishing periods were adversely affecting both the following sonar periods, and the crew. Maintaining a rigorous sampling schedule with the additional mesh sizes and sheer bulk of the larger nets began to physically take it's toll on project staff.

Overall results did not show any improvement in Chinook estimates when using the 50 fathom nets to apportion the sonar results and, in fact, estimates decreased (Table 4). Comparisons of mean fish length (mid-eye to tail fork) by mesh size for Chinook, summer chum, and "other" species seemed to indicate that the two net lengths tracked each other well (Figures 2, 3, and 4). On the left bank there was some increase in cpue (catch per fathom-hour) for Chinook with the 50 fathom nets, at least at higher passage rates. The opposite was true on the right bank, and this is likely due to the steep bottom profile. The longer net would provide little to no advantage, since a larger proportion of the net would be in water too deep to effectively fish it's entire length. It's unclear why the 25 and 50 fathom nets on the left bank showed no clear pattern for summer chum salmon. On the right bank, summer chum tracked closely until the final two days of fishing.

Daily estimates of summer chum tracked very closely throughout for both net lengths (Figure 7). The 50 fathom nets consistently estimated smaller numbers of Chinook at higher passage rates, and no clear picture emerged for the category "Other", although relative abundance numbers appear to trend together. Data and detailed information about the project can be obtained from the project proponents.

2. Study Area: Yukon River Mainstem; vicinity of Pilot Station

Table 1. Daily sampling schedule for sonar and testfishing periods.

Time ^b	Sonar ^a		Testfishing
	Right Bank	Left Bank	
Period 1			
05:30	S1	S3	
06:00	S2	S4	
06:30	S1	S5	
07:00	S2	S3	
07:30	S1	S4	
08:00	S2	S5	
08:30			
09:00			Period 1
09:30			
10:00			
10:30			
11:00			
11:30			
12:00			
12:30			
13:00	Period 2		
13:30	S1	S3	
14:00	S2	S4	
14:30	S1	S5	
15:00	S2	S3	
15:30	S1	S4	
16:00	S2	S5	
16:30			
17:00			Period 2
17:30			
18:00			
18:30			
19:00			
19:30			
20:00			
20:30			
21:00	Period 3		
21:30	S1	S3	
22:00	S2	S4	
22:30	S1	S5	
23:00	S2	S3	
23:30	S1	S4	
00:00	S2	S5	

^a S1 = stratum 1, S2 = stratum 2, etc.

^b Alaska Daylight Savings Time

Table 2. Current sampling schedule for 25 fathom drift gillnets used in species apportionment during the summer season, by period and calendar day.

Calendar Day	Testfish Period	Net Length	Mesh Size	
Odd	1	25 Fathom	2.75"	5.25"
			7.5"	6.5"
	2	25 Fathom	7.5"	6.5"
Even	1	25 Fathom	8.5"	4.0"
			7.5"	6.5"
	2	25 Fathom	7.5"	6.5"
			2.75"	5.25"

Table 3. Modified sampling schedule for alternating 25 and 50 fathom drift gillnets used in species apportionment, by period and calendar day.

Calendar Day	Testfish Period	Net Length	Mesh Size	
Odd	1	25 Fathom	2.75"	6.5"
			7.5"	4.0"
			8.5"	5.25"
	2	50 Fathom	2.75"	6.5"
			7.5"	4.0"
			8.5"	5.25"
Even	1	50 Fathom	8.5"	5.25"
			7.5"	4.0"
			6.5"	2.75"
	2	25 Fathom	8.5"	5.25"
			7.5"	4.0"
			6.5"	2.75"

Table 4. Cumulative passage estimates for 25 vs. 50 fathom nets during the period June 9 through June 23.

Species	25 fathom	50 fathom	difference
Chinook	39,355	34,785	-4,570
Summer chum	380,144	383,159	3,015
Pink	1,728	2,174	446
Other	45,843	47,790	1,947

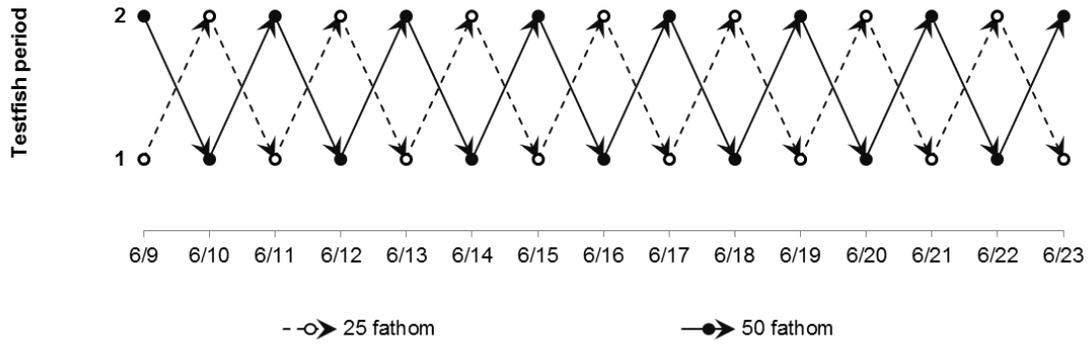


Figure 1. Alternating schedule of 25 and 50 fathom gillnet suites.

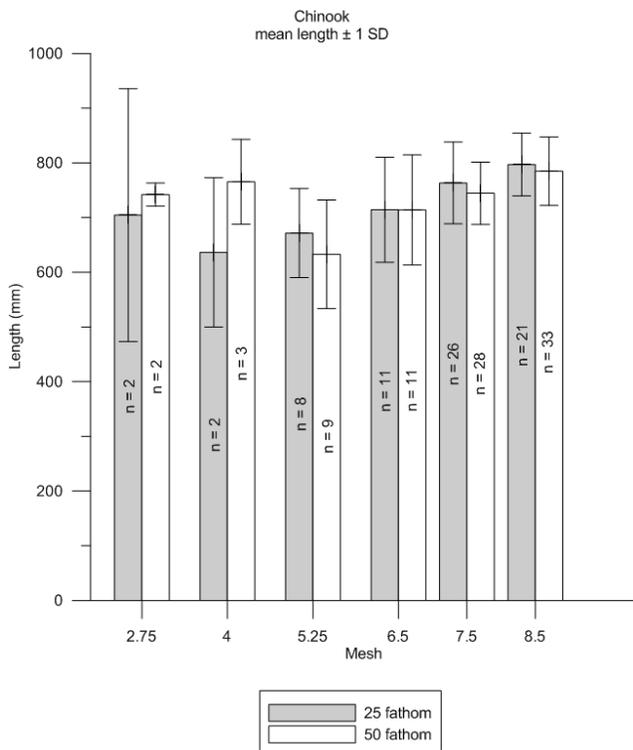


Figure 2. Mean length of Chinook salmon by mesh size and net length.

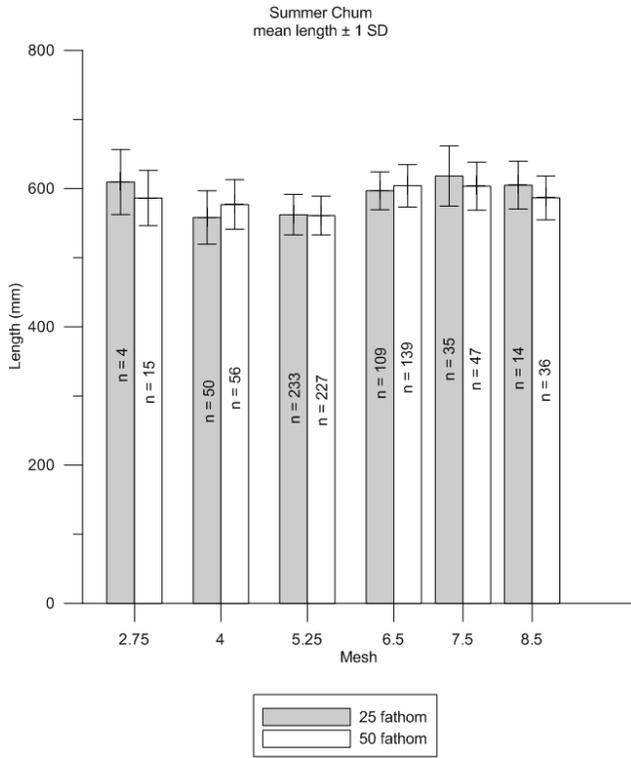


Figure 3. Mean length of summer chum salmon by mesh size and net length.

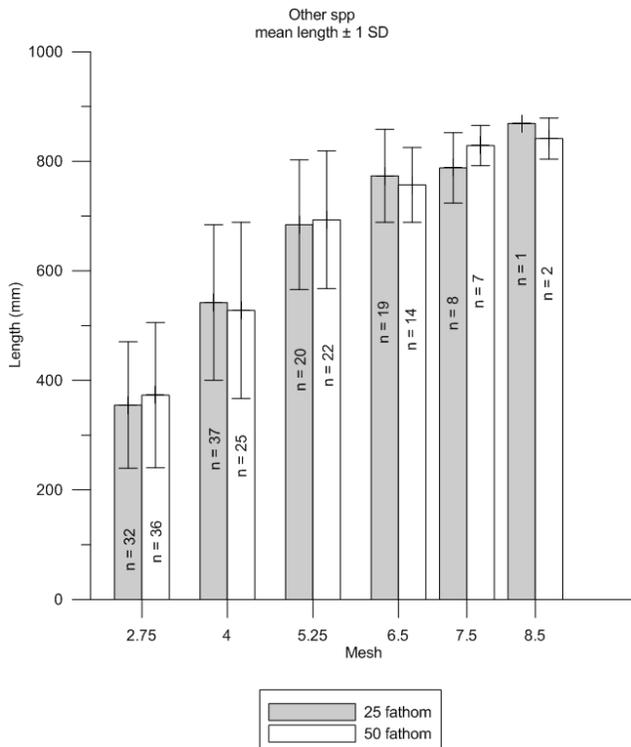


Figure 4. Mean length of other species by mesh size and net length.

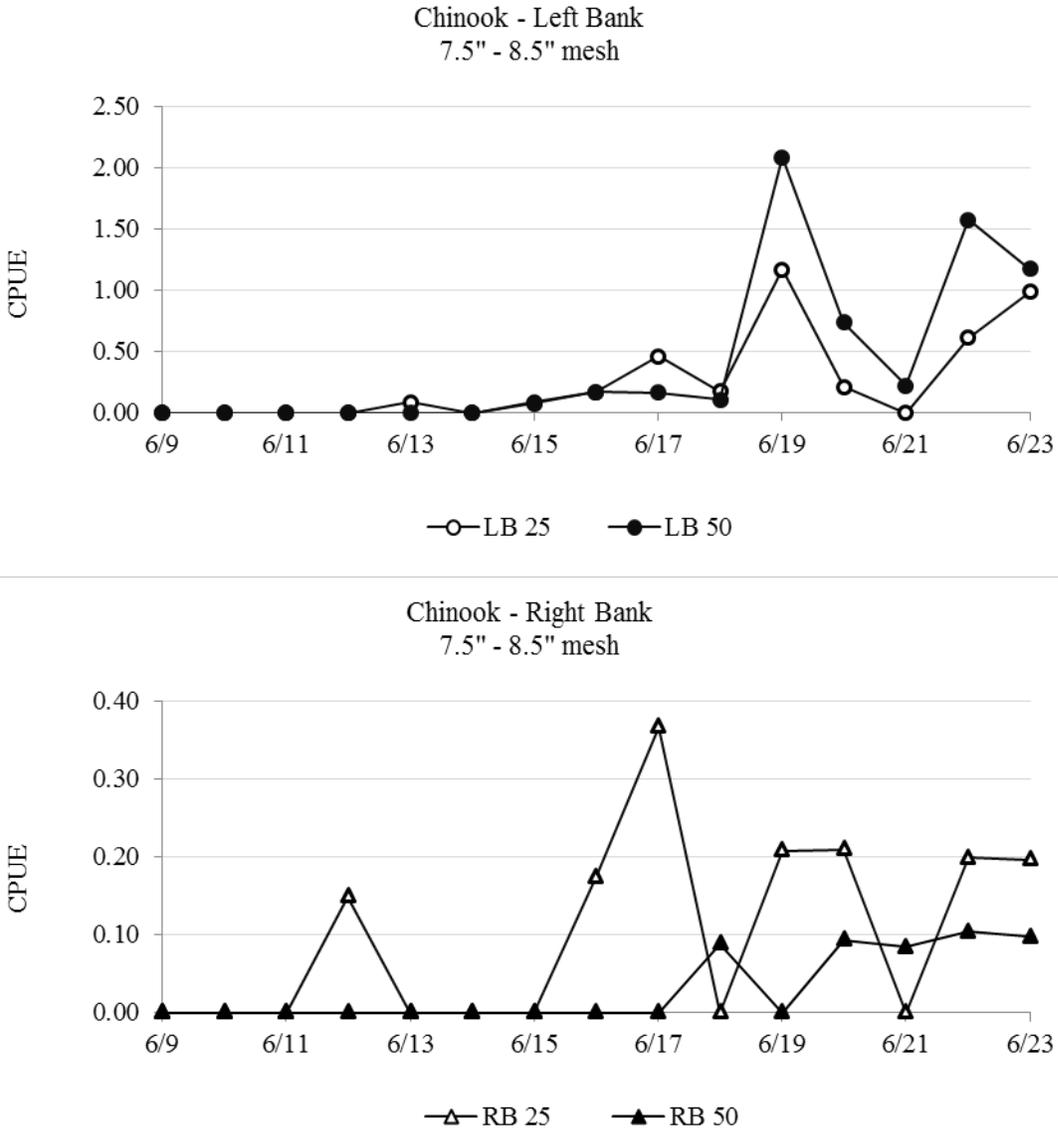


Figure 5. Comparison of Chinook cpue (fathom-hours) by bank and net length.

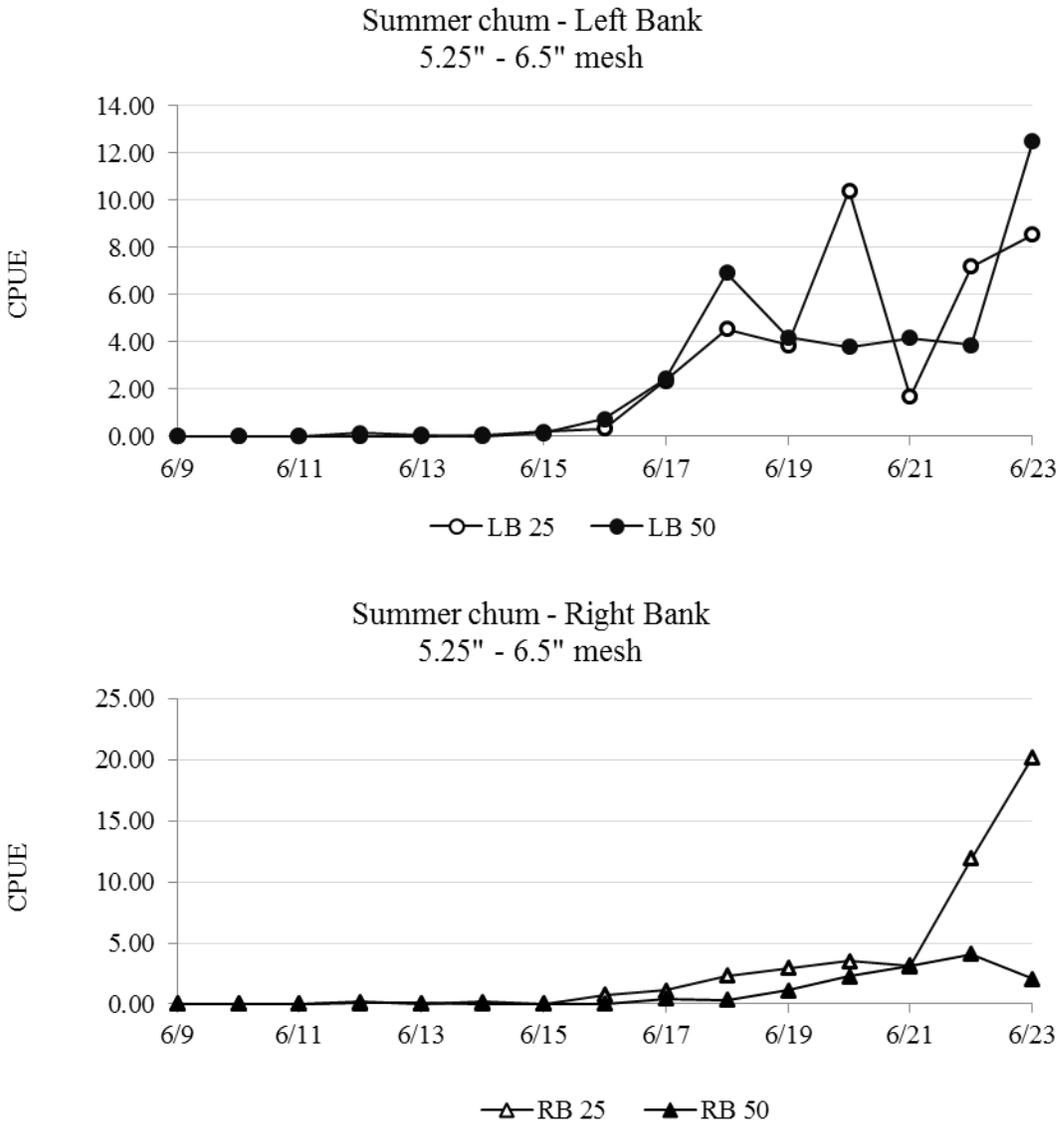


Figure 6. Comparison of summer chum cpue (fathom-hours) by bank and net length.

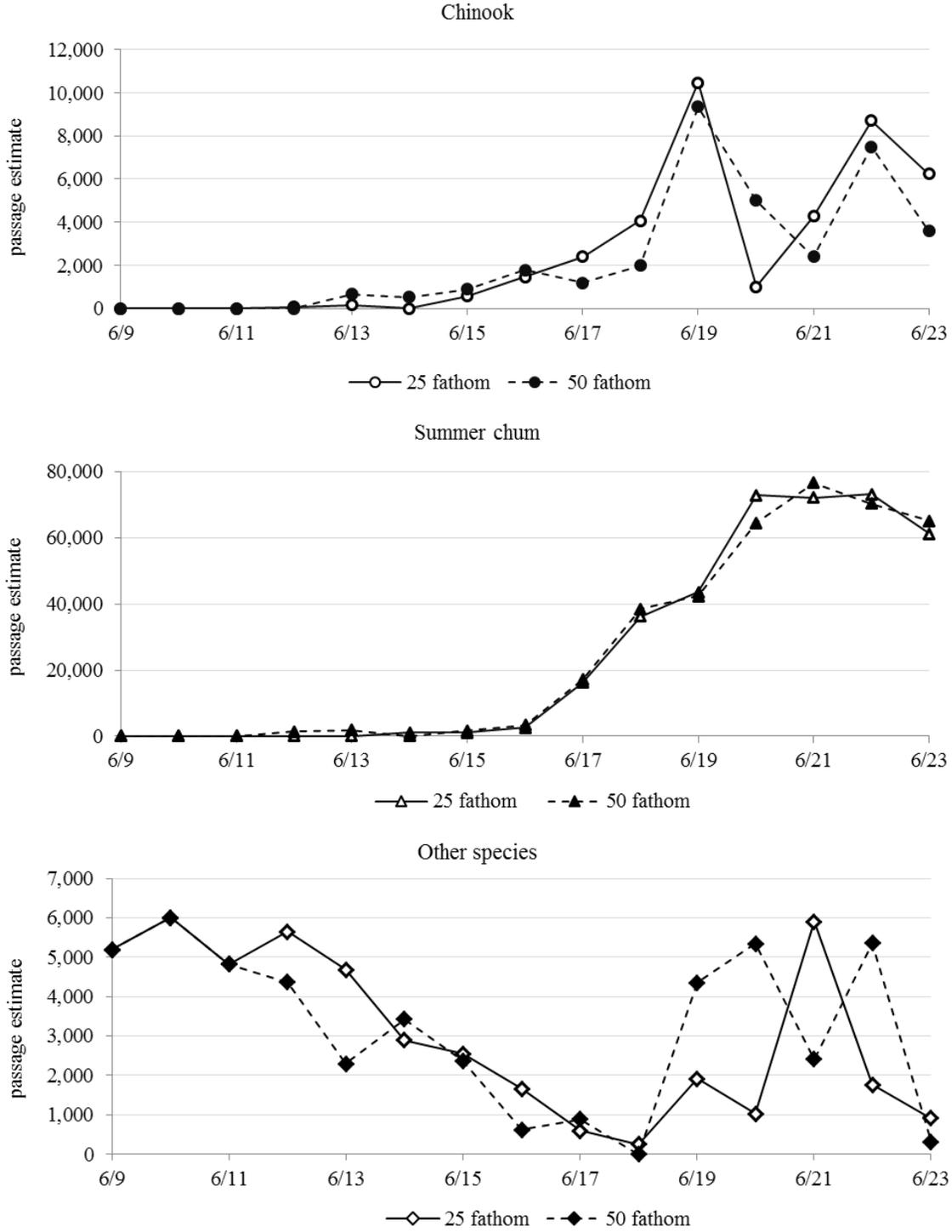


Figure 7. Daily passage estimate comparisons using 25 or 50 fathom length nets for species apportionment.