



Advisory Announcement

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Contact Information

Jordan Head, Area Research Biologist
Sara Miller, Biometrician
Stacy Vega, Area Research Biologist
Phone: (907) 267-2166
Fax: (907) 267-2442

2022 TOGIAK HERRING FORECAST

The 2022 Togiak herring biomass forecast is 357,536 short tons with Togiak District sac roe and spawn-on-kelp fishery, and the Dutch Harbor food and bait fishery harvest allocations listed below. The gear group allocation specified in the *Bristol Bay Herring Management Plan* 5AAC 27.865(b)(5) is 80% purse seine and 20% gillnet in the Togiak District. The following represents the allocations and quotas based on updated regulations and a 20% exploitation rate.

Table 1.—The 2022 Togiak District Pacific herring biomass and harvest forecast and allocation by fishery and gear.

	Biomass (Short Tons)	Harvest (Short Tons)
Biomass Estimate	357,536	
Total Allowable Harvest (20% exploitation rate)		71,507
Togiak Spawn on Kelp Fishery (Fixed Allocation)		1,500
Remaining Allowable Harvest		70,007
Dutch Harbor Food/Bait Allocation (7% of remaining allocation)		4,900
Togiak District Sac Roe Fishery		65,107
Purse Seine Allocation (80%)		52,086
Gillnet Allocation (20%)		13,021

The 2022 mature herring biomass forecast is 357,536 tons and is the highest forecast since an age-structured assessment model was first used for the 1993 forecast (Figure 1). Under a 20% exploitation rate, the 2022 potential harvest is 71,507 tons in all fisheries and 65,107 tons in the Togiak sac roe fisheries (purse seine and gillnet). The large forecast is due primarily to the largest estimated recruitment of age-4 fish on record in 2021 (about 1.5 times larger than the large recruitments seen in the early 1980s) and one of the largest recruitments on record in 2020. These cohorts are projected to make up an even larger portion of the population in 2022 due to increasing maturity (Figure 2). The majority of the mature population in 2022 is age-5 and age-6 fish, both by number (52% and 20% respectively) and by biomass (45% and 21% respectively; Figure 2). The forecast average weight of a fish in the 2022 mature population is 281 g (Figure 2), whereas the forecast average weight of a fish that is vulnerable to the commercial purse seine fishery is 297 g.

The assessment model used to forecast the Togiak herring population utilizes time series of catch, age composition of the purse seine harvest, age composition of the mature population, and aerial survey biomass estimates plus catch data from 1980 forward. Samples from the entire commercial purse seine harvest are used to estimate age composition of the seine harvest. Samples from the commercial purse seine harvest near in time to the peak survey and the postfishery survey are used to estimate age composition of the mature population biomass. Peak aerial survey biomass and postfishery aerial survey biomass estimates are combined with presurvey harvest (purse seine and gillnet) to estimate mature biomass. The assessment model uses between-dataset weighting and variable weighting within the aerial survey dataset to reflect the confidence staff has in the respective datasets and the confidence staff has in the individual aerial survey estimates. Confidence in the individual aerial survey estimates is based on the number of surveys, timing of surveys, weather, and water conditions. The forecasted average weight-at-age of herring for 2022 was calculated using an average of recent years (2019, 2020, 2021) of commercial purse seine fishery samples.

This forecast has considerable uncertainty largely due to the recruitment component of the age-structured assessment model. Good survey conditions in 2021 generated an aerial survey peak biomass estimate with a relatively high overall confidence ranking of 0.90 out of 1.0. While uncertainty estimates are not yet produced for Togiak forecasts, there is considerable uncertainty in the 2022 forecast due to the recent large recruitment (age-4) events and the resultant uncertainty in the forecasted numbers of Togiak age-5 fish (2017 brood year) and age-6 fish (2016 brood year) in 2022. The true maturity schedule for the Togiak population is not well known and the magnitude of the recruitment of age-4 fish in 2020 and 2021, as well as the forecasted number of fish from these large year classes in 2022, depends on this schedule. In addition, the model estimates a single survival rate across all ages and years and if the survival of exceptionally large year classes differs from others, this will not be captured in the forecast.

Herring are detected in our sampling when they recruit into the fishery; a process that begins around age-4 and may not be fully complete until approximately age-9. Large recruitments in this population generally occur every eight to ten years and typically last one or two years. Recent biological sampling suggests that we are in a new large recruitment event. It is difficult to measure contributions of young age classes because these fish are not fully recruited (available) in the harvest and often arrive on the spawning grounds near the end of, or after, the fishery. Improved estimation of herring year class size is expected as cohorts are observed in the fishery in subsequent years.

Under Alaska's Outbreak Health Orders 5, 6, and 8, commercial fishing is an Essential Business and is part of Alaska's Essential Services and Critical Infrastructure. Commercial fishermen should ensure that all travel and other activities in support of commercial fishing operations follow protocols in Alaska COVID-19 Outbreak Health Orders. COVID-19 Outbreak Health Orders may be found here: <https://covid19.alaska.gov/health-order/>.

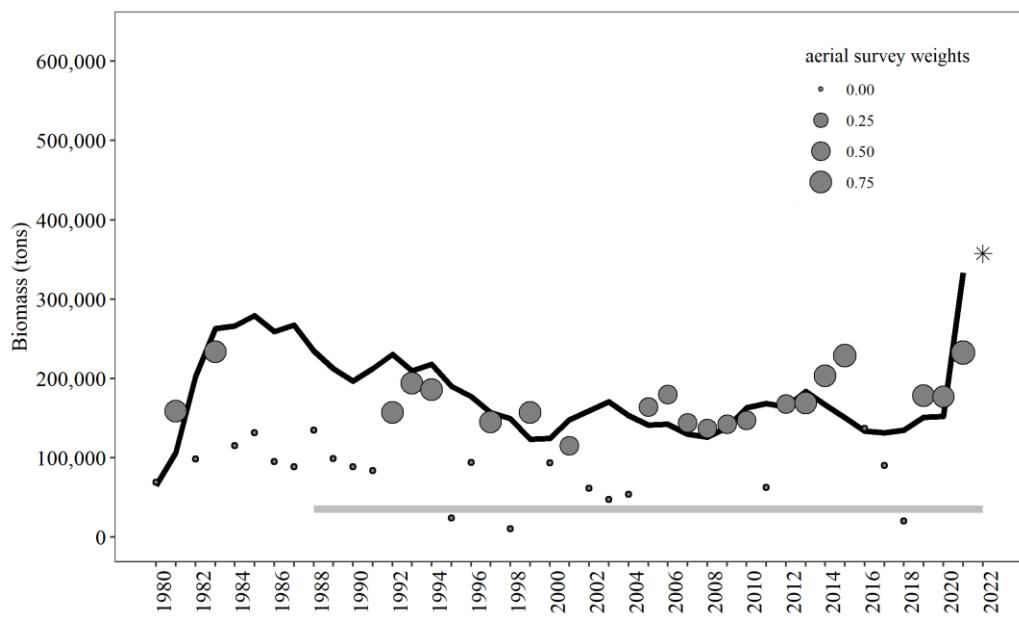


Figure 1.– Aerial survey-estimated biomass plus pre-peak catch that were included in the model (grey points), model-estimated mature biomass (black solid line), and model-estimated mature biomass forecast (black star). The size of the grey points reflect the confidence weighting of each aerial survey estimate in the model based on weather, number of surveys, quality of surveys, and timing of surveys relative to the spawn (ranging from 0 = no confidence to 1 = perfect confidence). The confidence ranking in 2021 was 0.90. The grey line denotes the threshold biomass of 35,000 tons.

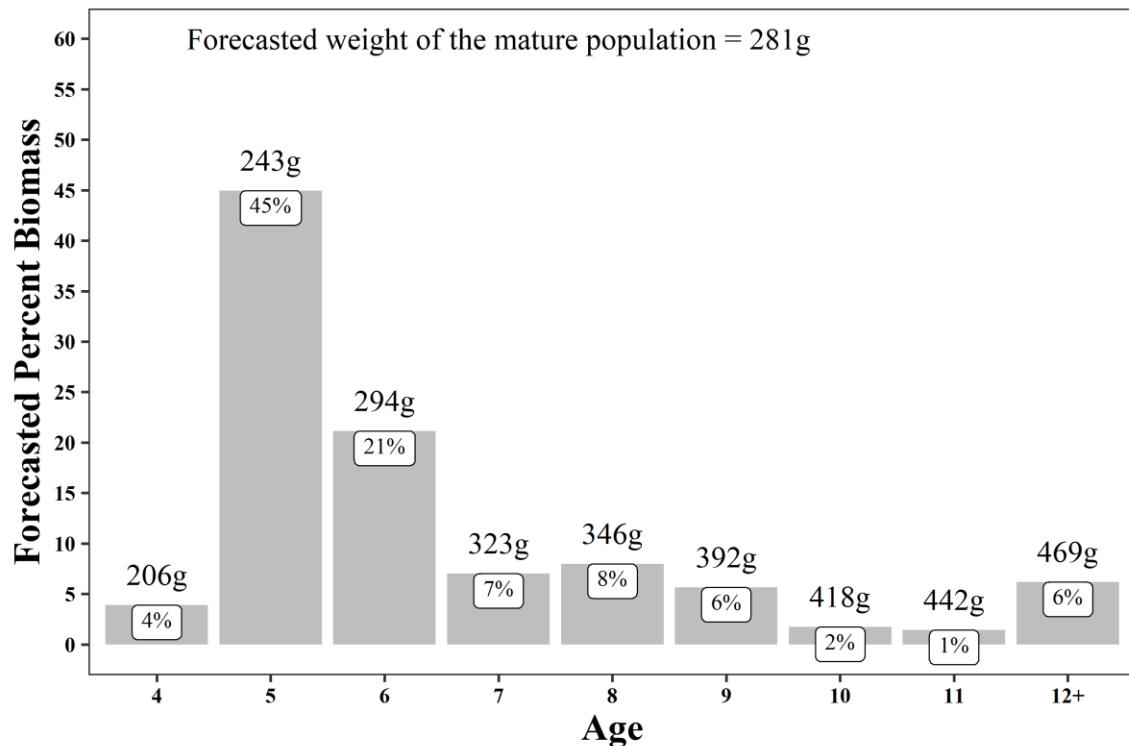


Figure 2.– Forecasted percent mature biomass by age with average weight (grams) for each age class as well as the average weight of the forecasted 2022 mature biomass as a whole (281g).