

**ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
NEWS RELEASE**



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2011 TOGIAK HERRING FORECAST

The 2011 Togiak herring forecast and harvest allocation are listed below for the Togiak District sac roe and spawn-on-kelp fishery, and the Dutch Harbor food and bait fishery, given a maximum 20% exploitation rate of the projected run biomass:

Harvest Allocation of the 2011 Forecasted Pacific Herring Run Biomass, Togiak District, Bristol Bay

	Biomass (Short Tons)	Harvest (Short Tons)
Forecasted Biomass for 2011	140,860	
Total Allowable Harvest (20% exploitation rate)		28,172
Togiak Spawn-on-Kelp Fishery (Fixed Allocation)		1,500
Remaining Allowable Harvest		26,672
Dutch Harbor Food/Bait Allocation (7.0% of the remaining allocation)		1,867
Remaining Allowable Harvest for Togiak District Sac Roe Fishery:		24,805
Purse Seine Allocation 70.0%		17,364
Gill Net Allocation 30.0%		7,442

2011 TOGIAC HERRING FORECAST SUMMARY

The Pacific herring population is forecasted to be 140,860 tons in Togiak District during 2011 (Figure 1). Younger herring (ages 4–6), returning from the 2005 through 2007 year classes, are expected to comprise 38.2% of the biomass in 2011 (Figure 2). The remainder of the population biomass will be comprised of herring ages 7–8 (32.8%), ages 9–11 (20.2%) and ages 12+ (8.8%). The forecasted individual average weight of herring in the harvest biomass is 340 g.

A run biomass of 140,860 tons would be ~1% less than the recent 10-year average observed biomass of 142,319 tons. A biomass of this size would potentially produce an overall harvest of 28,172 tons in all fisheries and 24,805 tons in the Togiak sac roe fisheries (purse seine and gillnet). A harvest of this size in the Togiak sac roe fisheries would be ~17% more than the recent 10-year average harvest of 20,589 tons.

We use an age-structured analysis (ASA) model to forecast the Togiak herring population that incorporates catch and age composition data as well as total run biomass estimates. The ASA model integrates data from purse seine fishery age compositions (1978–2010), total run age compositions (1978–1995, 1997, 1999, 2001, and 2005–2010), and aerial survey biomass estimates (1981, 1983, 1992–1994, 1997, 1999–2001, and 2005–2010). The model estimates were generated by comparing them to observed data. Samples from non-selective gear (commercial purse seine) were used to assess age composition of the total run biomass. Commercial purse seine catch samples ranged from age 3 to age 17. Age-4 herring average weight for 2011 was predicted using the recent four-year average while simple linear regression models were used to forecast average weight of age-5 through age-15 herring based on their weight the previous year.

A temporal change in age composition from older to younger herring typically occurs during this fishery. However, the 2010 inshore spawning biomass consisted largely of younger herring age 5–8 with a few discrete pulses of older fish. Herring between age 5 and age 8 (inclusive) made up 51.4% of the total commercial purse seine harvest, 45.2% of the total harvest, 37.8% of the total run and 47.8% of the escapement by weight.

Large recruitments in this population are typical every eight to ten years. During the last few years, one of these recruitment events appears to have been underway. However, the contribution of age-4 fish to the total run dropped to less than 5% in 2010 from the 10–20% observed in 2008 and 2009. This may be a signal that this period of high recruitment is complete. However, it should be noted that measuring contributions of younger age classes to the spawning biomass is difficult as they typically do not show up until late in the fishery and the department no longer conducts post-fishery sampling as was typical during the 1980s.

The biomass of the Togiak herring spawning population has been estimated with aerial surveys since the late 1970s, concurrent with development of the sac-rope fishery. Total run biomass for 2010 was estimated to be 135,214 tons. This was the sum of the peak biomass observed on the aerial survey conducted 18 May (98,290 tons) and postseason survey conducted 2 June (36,924 tons). The time between these surveys leads us to believe that a near complete turnover of herring on the spawning grounds had occurred between these surveys. Herring were first observed in the district on 10 May, when approximately 2,371 tons were documented, mostly around Hagemester Island and between Anchor Point and Right Hand Point. The biomass steadily increased through 18 May before declining, with herring most heavily concentrated in Togiak Bay throughout the season (Figure 3).

There is always uncertainty in forecasting the Togiak District herring biomass and predicting the 2011 run is no different. Although the ASA model has had a tendency to under-forecast since its inception in 1993, it over-forecast the 2010 run (146,775 tons forecast and 135,214 tons observed). The mean percent error (MPE) has been -19.7% for years with reliable total run biomass estimates (Figure 1). The accuracy or mean absolute percent error (MAPE) of the ASA model is currently running at 19%. The forecast range for 2011 is from 114,067 tons to 167,653 tons based on a MAPE of 20%. We consider this population to be healthy and sustainable.

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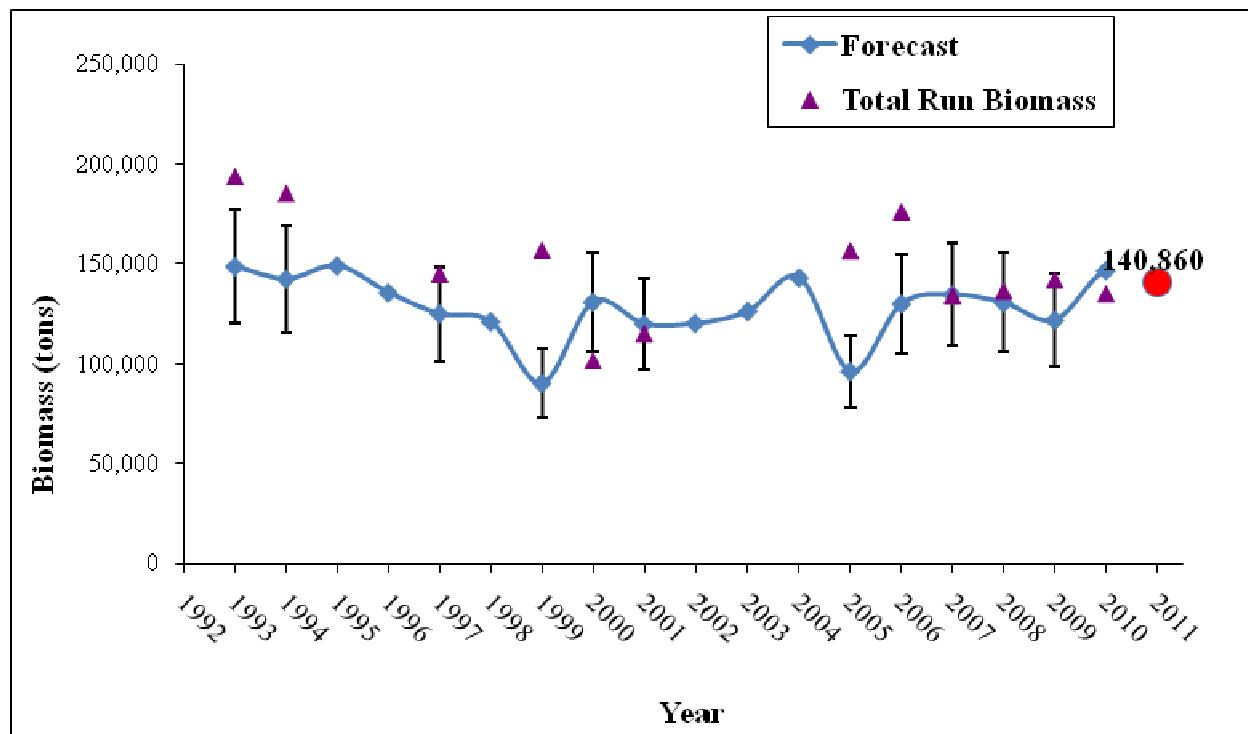


Figure 1.—Annual observed Togiak herring total run biomass estimates and preseason forecasts based on the ASA model. Mean absolute percent error (MAPE) of 25% around the forecast is also shown for years with a reliable total run biomass estimate.

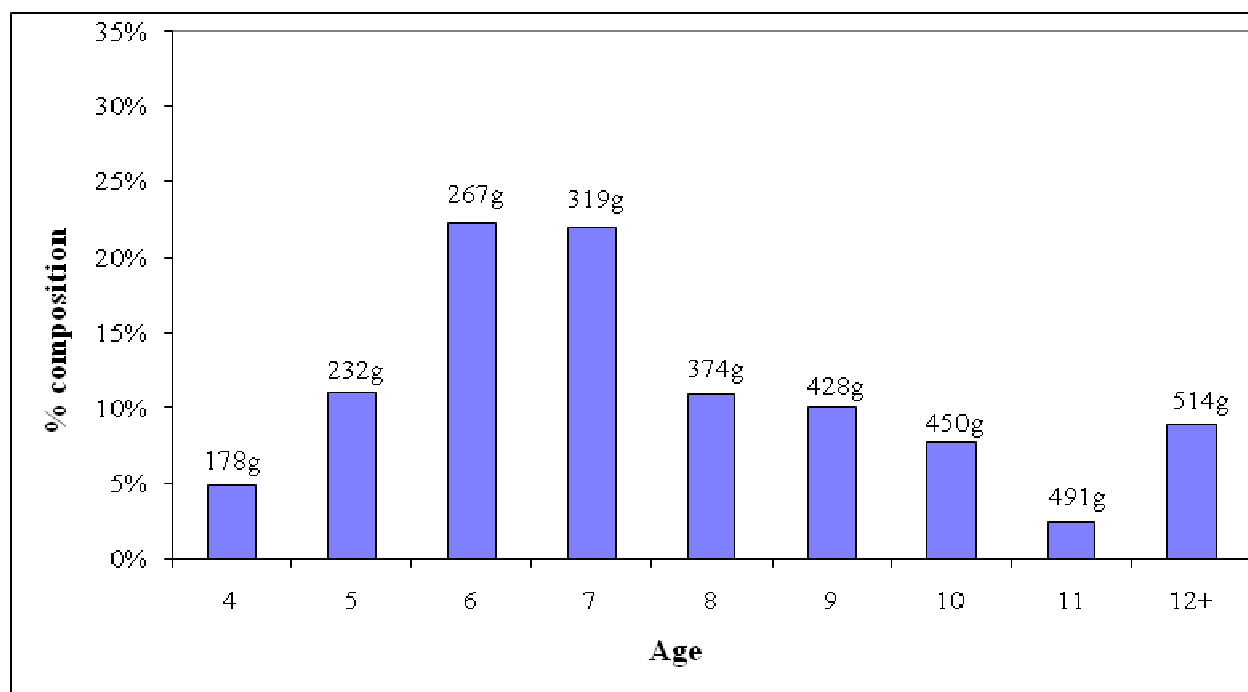


Figure 2.—Forecasted age composition by weight for the 2011 Togiak herring return. Forecasted average weight (grams) shown for each age category.

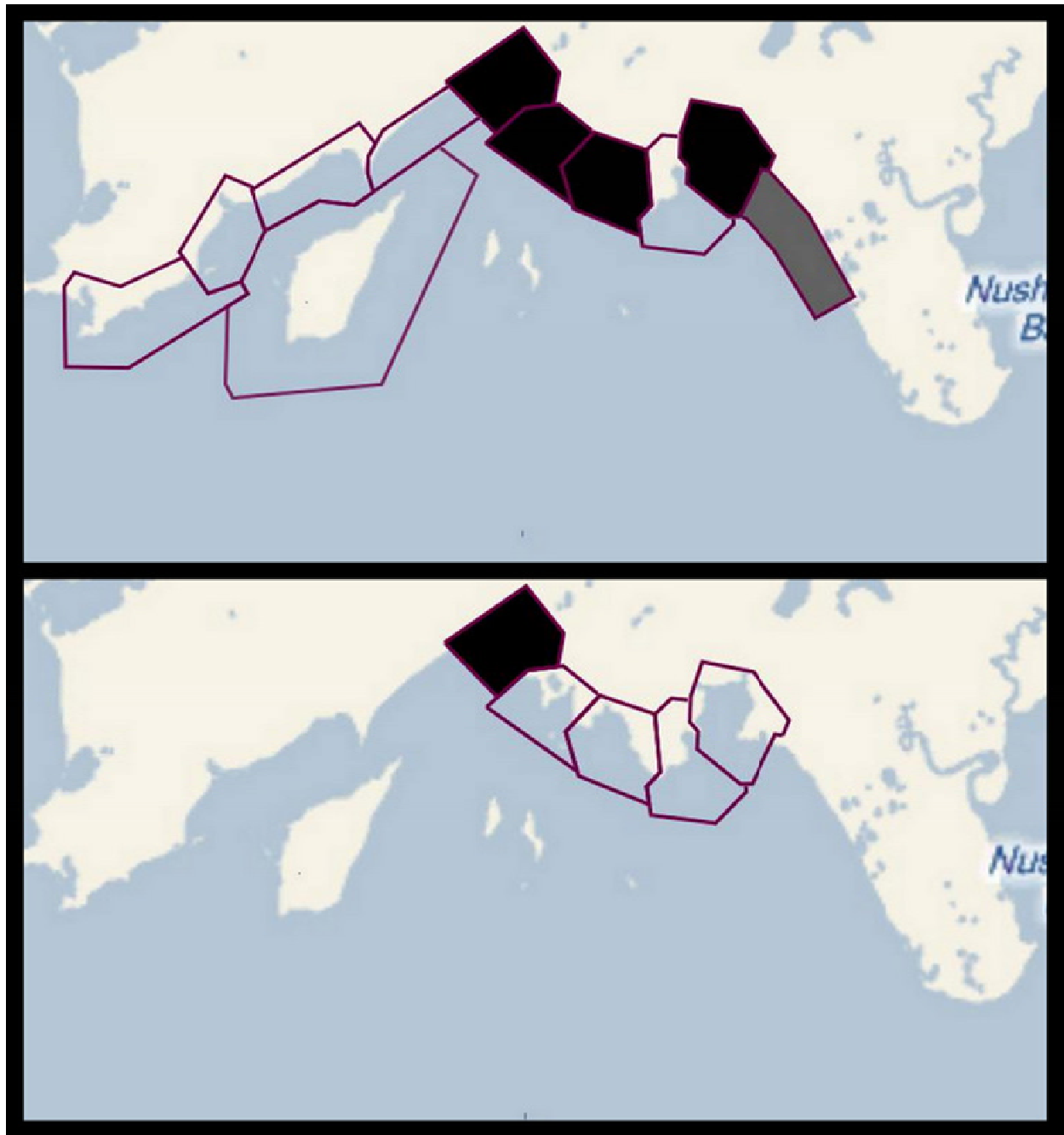


Figure 3.—Herring spawning distribution observed during aerial surveys conducted on 18 May 2010 (top) and 2 June 2010 (bottom). Aerial survey sections with measurable biomass are outlined while sections with biomass >5,000 tons are shaded grey and sections with biomass >10,000 tons are shaded black.