

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



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 Date Issued: 11/10/11
 Time: 1:00 p.m.

2012 TOGIAC HERRING FORECAST

The 2012 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 (5 AAC 27.865).

Harvest Allocation of the 2012 Forecasted Pacific Herring Run Biomass, Togiak District, Bristol Bay

	Biomass (Short Tons)	Harvest (Short Tons)
Forecasted Biomass	123,745	
Total Allowable Harvest (20% exploitation rate)		24,749
Togiak Spawn-on-Kelp Fishery (Fixed Allocation)		1,500
Remaining Allowable Harvest		23,249
Dutch Harbor Food/Bait Allocation (7.0% of the remaining allocation)		1,627
Remaining Allowable Harvest for Togiak District Sac Roe Fishery		21,622
Purse Seine Allocation 70.0%		15,135
Gillnet Allocation 30.0%		6,487

2012 TOGIAC HERRING FORECAST SUMMARY

The 2012 Pacific herring population forecast is 123,745 tons for the Togiak District 2012 (Figure 1). Age-7 and -8 herring returning from the 2005 and 2006 year classes are expected to comprise 52.1% of the biomass in 2012 (Figure 2). The remainder of the run will be comprised of herring ages 4–6 (19.1%), ages 9–11 (23.3%) and ages 12+ (5.5%) by weight. The forecasted individual average weight of herring in the harvest biomass is 323 g.

A run biomass of 123,745 tons would be ~16% less than the recent 10-year average. A biomass of this size has the potential to produce an overall harvest of 24,749 tons in all fisheries and 21,620 tons in the Togiak sac roe fisheries (purse seine and gillnet). A harvest of this size in the Togiak sac roe fisheries would be ~20% more than the recent 10-year average harvest.

An age-structured analysis (ASA) model was used 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 (1978–2011), 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). Samples from nonselective gear (commercial purse seine) are used to assess age composition of the total run biomass when a total run biomass is estimated. Commercial purse seine catch samples from 2011 ranged from age 4 to age 16. The average weight of age-4 herring for 2012 is estimated as the most recent 4-year average while simple linear regression models of historical trends are used to forecast average weights of remaining age classes.

A temporal change in age composition from older to younger herring typically occurs during this fishery. However, the 2011 inshore spawning biomass age composition was fairly stable and consisted largely of age-6 and -7 herring with a few discrete pulses of older fish. These age classes accounted for 47% of the total commercial purse seine harvest and 41% of the total harvest by weight.

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 2011 was not estimated because aerial survey efforts were inadequate to measure the peak inshore biomass, primarily due to poor weather. Estimating the peak inshore biomass is a necessary precondition for estimating total run biomass. Surveys were flown between 27 April and 26 May and while most of the biomass was observed in the center of Togiak Bay, smaller concentrations of herring were noted in the vicinity of Nunavachak Bay to the east and Hagemester Island to the west (Figure 3).

Herring become visible to our sampling effort when they recruit into the fishery; a process that we believe begins around age-4. Large recruitments in this population generally occur every 8 to 10 years. The last recruitment event experienced by Togiak herring was observed as the relatively large numbers of age-4 herring present in 2008 and 2009. It should be noted that measuring contributions of age classes less than three to the spawning biomass is difficult because these fish are not fully recruited (vulnerability to the gear) and they often arrive on the spawning grounds after older fish when sampling has ceased, unlike the post-fishery sampling that occurred in the 1980s.

There is always uncertainty in forecasting the Togiak District herring biomass. The mean percent error (MPE) has been -20% for years with reliable total run biomass estimates (Figure 1). The accuracy or mean absolute percent error (MAPE) of the ASA model is 19%. The forecast range for 2012 is 72,859 tons to 174,631 tons based on a MAPE of 20%. We consider this population to be healthy and sustainable.

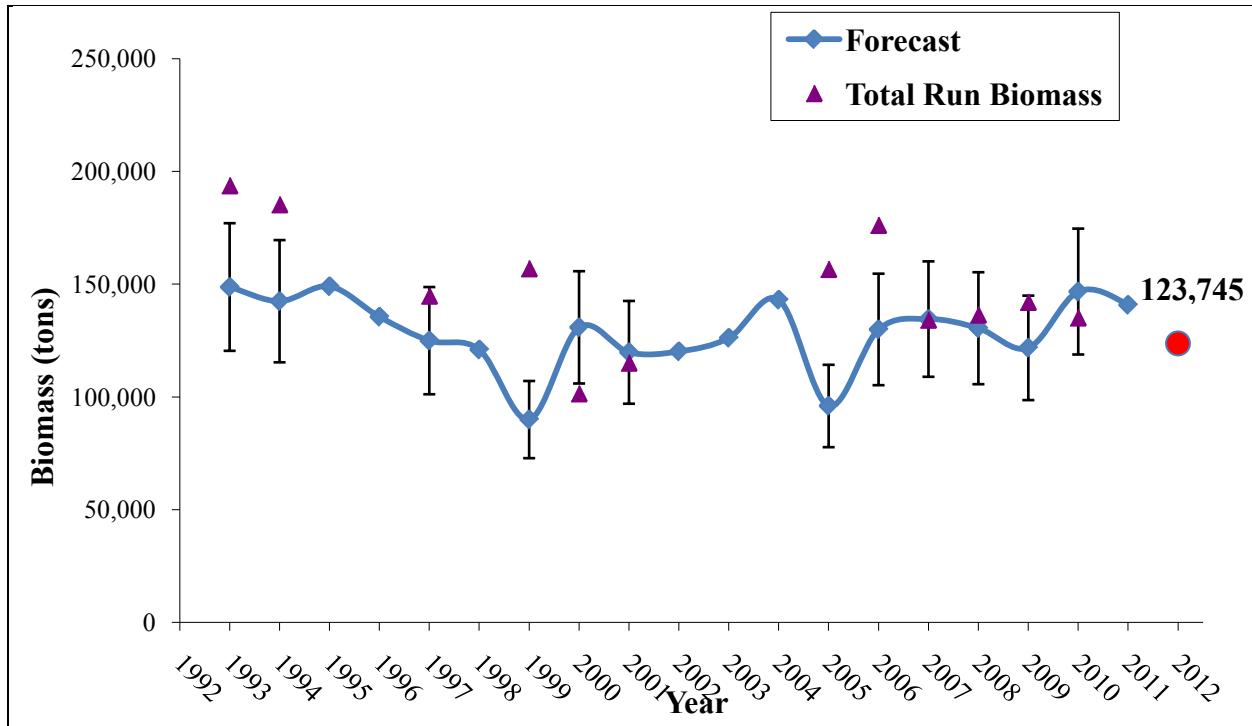


Figure 1.—Annual observed Togiak herring total run biomass estimates and preseason forecasts based on the ASA model. Mean absolute percent error (MAPE) of 25% around the forecast is also shown for years with a reliable total run biomass estimate.

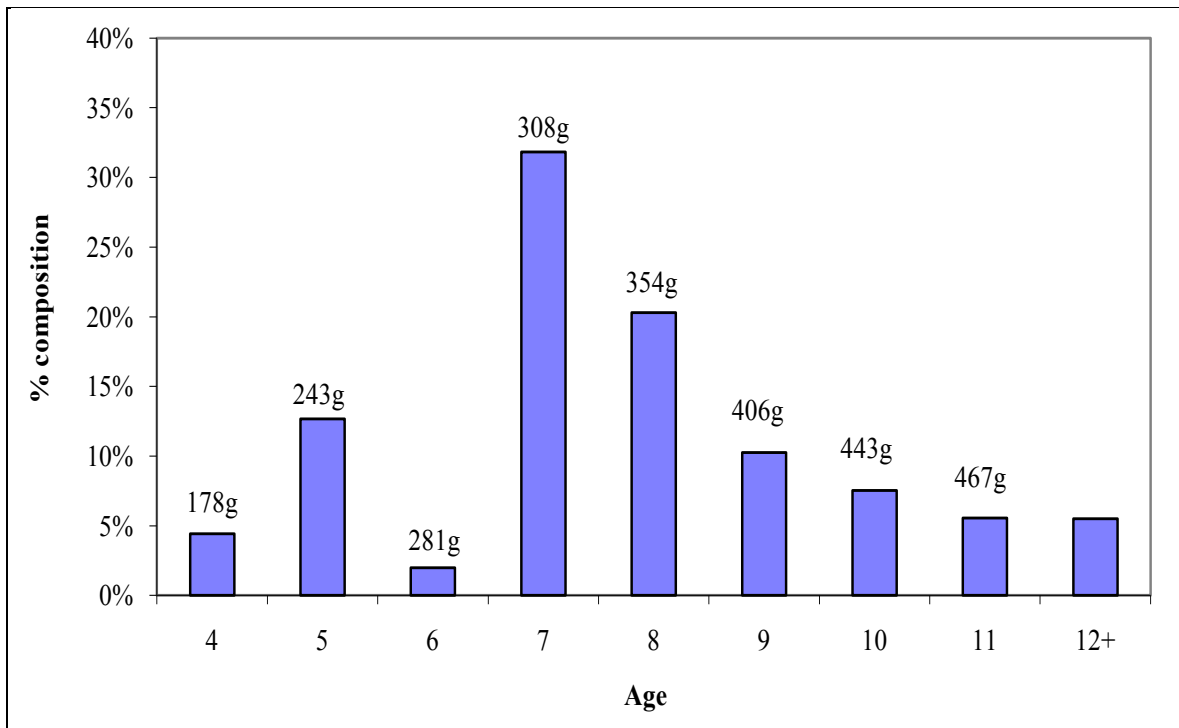


Figure 2.—Forecasted age composition by weight (grams) for the 2012 Togiak herring return. Forecasted average weight is shown for each age category.

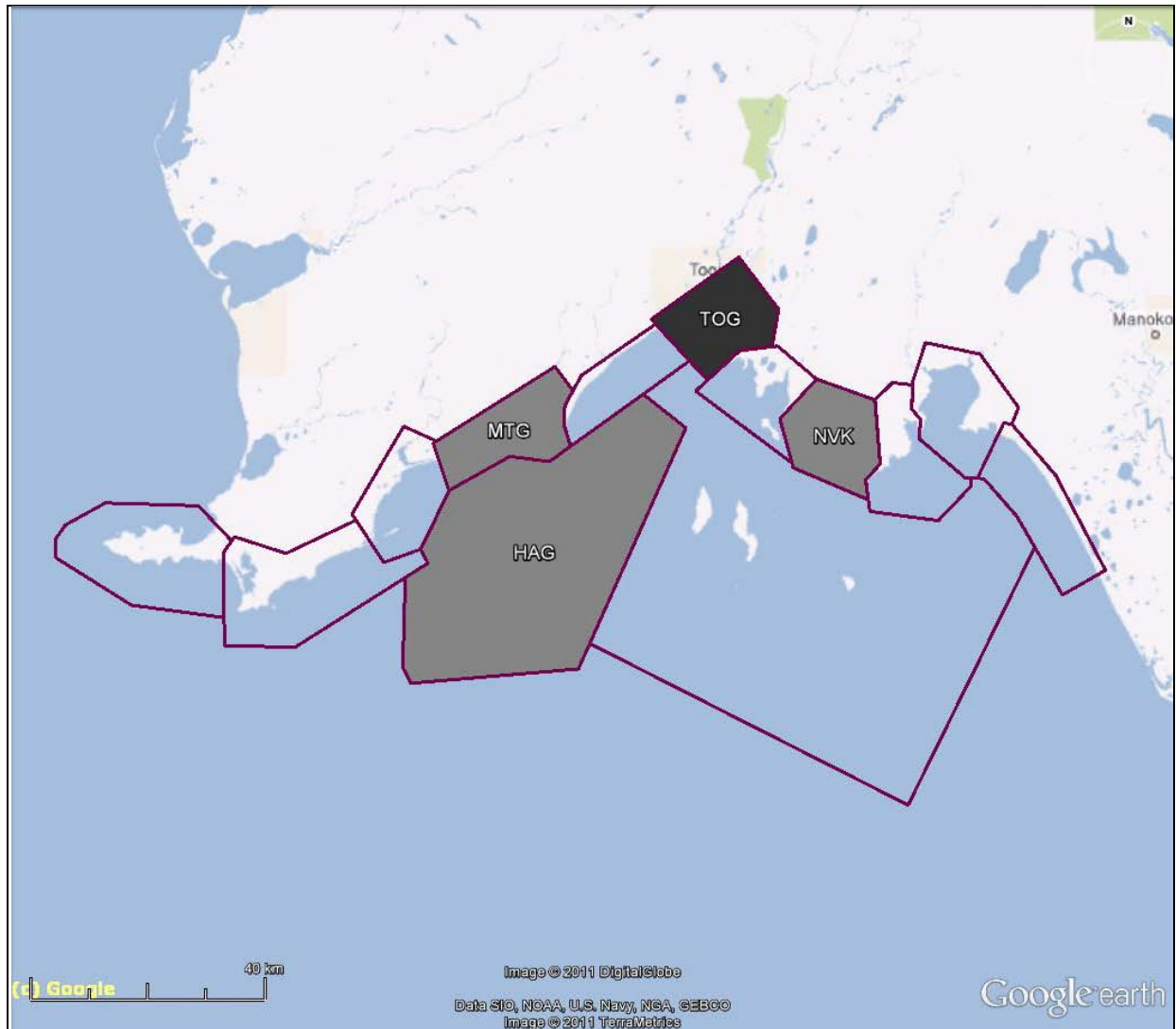


Figure 3.—Herring distribution observed during aerial surveys conducted during 2011. Survey section shaded in black (TOG=Togiak) recorded slightly more than 50% of the cumulative biomass measured across all surveys while sections with 6–12% of the cumulative recorded biomass are shaded grey (HAG=Hagemeister; MTG=Matogak; and NVK=Nunavachak). Herring were observed in all survey sections during 2011.