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

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2013 TOGIAK HERRING FORECAST

The 2013 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 (Bristol Bay Herring Management Plan 5 AAC 27.865):

Harvest Allocation of the 2013 Forecasted Pacific Herring Run Biomass, Togiak District, Bristol Bay

	Biomass (Short Tons)	Harvest (Short Tons)
Forecasted Biomass	169,094	
Total Allowable Harvest (20% exploitation rate)		33,819
Togiak Spawn-on-Kelp Fishery (Fixed Allocation)		1,500
Remaining Allowable Harvest		32,319
Dutch Harbor Food/Bait Allocation (7.0% of the remaining allocation)		2,262
Remaining Allowable Harvest for Togiak District Sac Roe Fishery:		30,056
Purse Seine Allocation 70.0%		21,040
Gill Net Allocation 30.0%		9,017

2013 TOGIAK HERRING FORECAST SUMMARY

The Pacific herring spawning biomass in the Togiak District was estimated at 167,738 tons in 2012 and is forecast to be 169,094 tons in 2013 (Figure 1). Age 7–8 herring returning from the 2006 and 2007 year classes are expected to comprise 46.9% of the biomass in 2013 (Figure 2). The remainder of the run is expected to be comprised of herring ages 4–6 (26.4%), ages 9–11 (22.6%) and ages 12+ (4.1%) by weight. The forecasted individual average weight of herring in the harvest biomass is 317 g.

A run biomass of 169,094 tons would be ~113% of the recent 10-year average. A biomass of this size has the potential to produce an overall harvest of 33,819 tons in all fisheries and 30,056 tons in the Togiak sac roe fisheries (purse seine and gillnet). A harvest of this size in the Togiak sac roe fisheries would be ~146% of the recent 10-year average harvest.

An age-structured analysis (ASA) model is used to forecast the Togiak herring population. This model utilizes catch and age composition data as well as total run biomass estimates. Currently, the ASA model integrates data from purse seine fishery age compositions (1978–2012), total run age compositions (1978–1995, 1997, 1999, 2001, 2005–2010, and 2012), and aerial survey biomass estimates (1981, 1983, 1992–1994, 1997, 1999-2001, 2005–2010, and 2012). Samples from non-selective 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 2012 ranged from age-3 to age-16. The average weight of age-4 herring for 2013 is estimated as the most recent four-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 2012 inshore spawning biomass age composition was fairly stable and consisted largely of age-7 herring. This age class accounted for 36% of the total commercial purse seine harvest and 32% 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-roe fishery. Estimating the peak inshore biomass is a necessary precondition for estimating total run biomass. Surveys were flown between 27 April and 26 May 2012 with most of the biomass observed in the center of Togiak Bay with smaller concentrations to the east and smaller still 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 eight to ten years. The last recruitment event experienced by Togiak herring was observed as relatively large numbers of age-4 herring 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 forecasted mean percent error (MPE) has been relatively stable at ~20% for years with reliable total run biomass estimates (Figure 1). The historical forecast accuracy or mean absolute percent error (MAPE) using the ASA model is 19.6%. Using this historical forecast error, the forecast range for 2013 is between 135,994 tons and 202,194 tons. We consider this population to be healthy and sustainable.
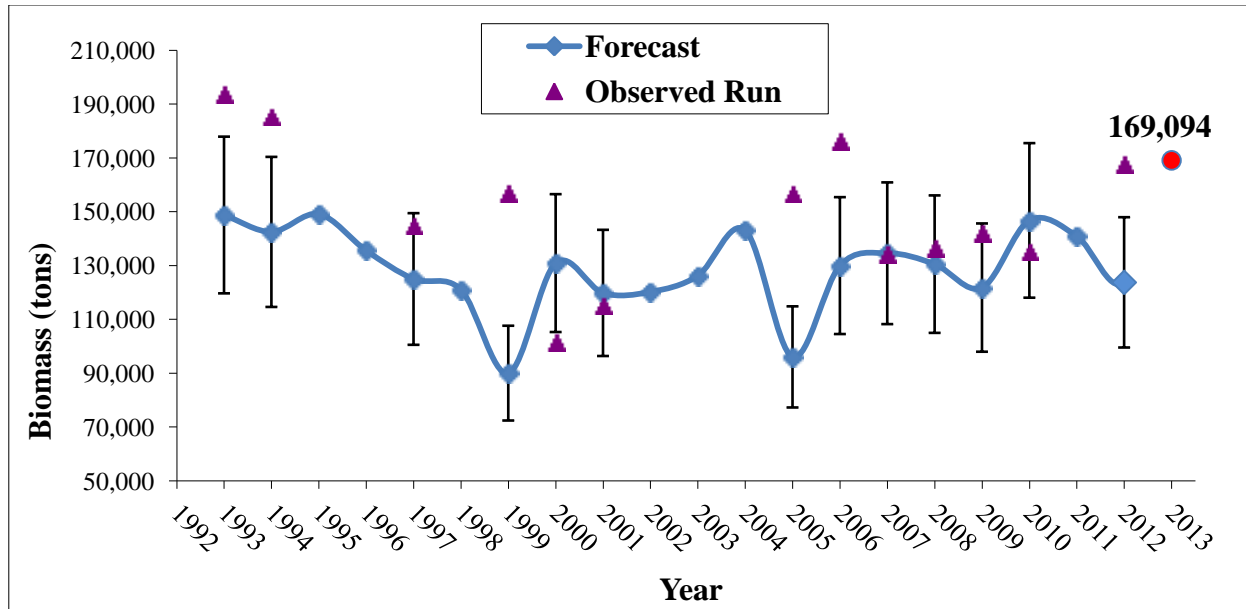
Figure 1.–Annual observed Togiak herring total run biomass estimates and preseason forecasts based on the ASA model. Mean absolute percent error (MAPE) of 20% around the forecast is also shown for years with a reliable total run biomass estimate.
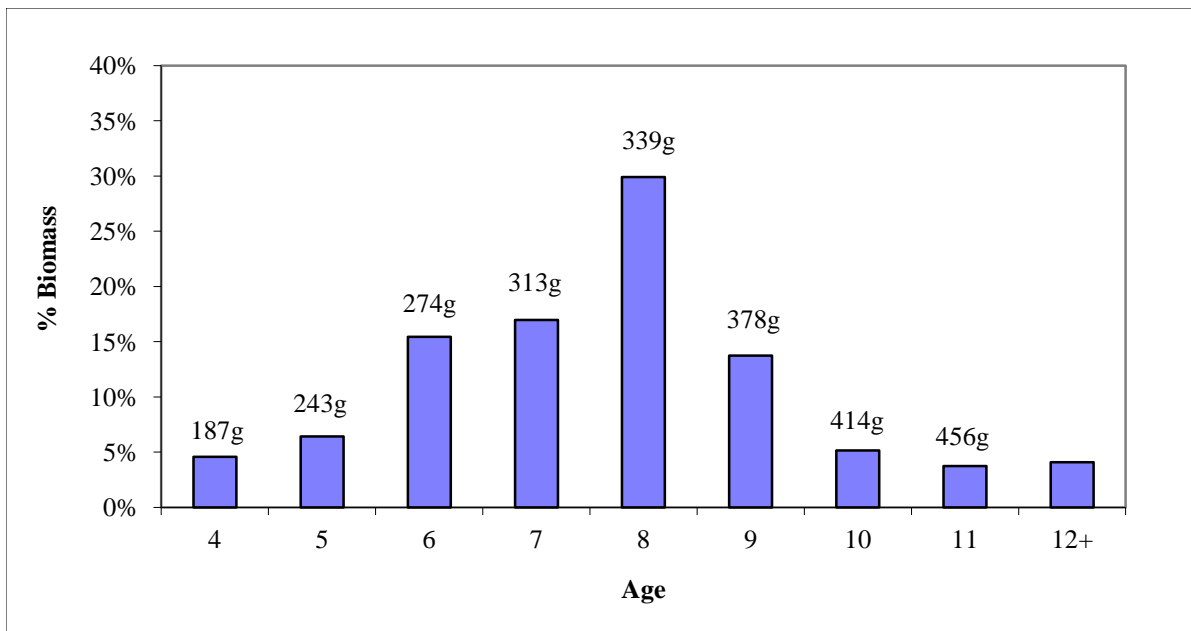

Figure 2.–Forecasted age composition by weight (grams) for the 2013 Togiak herring return. Forecast average weight shown for each age.

Note: NUS = Nushagak Peninsula; KUK = Kulukak; MET = Metervik; NUK = Nunavachak; UGL = Ungalikthluk/Togiak; TOG = Togiak; TNG = Tongue Pt.; MTG = Matogak; HAG = Hagemeister; OSK = Osviak; PYR = Pyrite Point; CPN = Cape Newenham; WAL = Walrus Islands.

Figure 3.–Herring distribution observed during aerial surveys conducted during 2012. Survey section shaded in black recorded roughly 50% of the cumulative biomass measured across all surveys while sections with 6+% of the cumulative recorded biomass are shaded grey. Herring were observed in all survey sections during 2012 except Cape Newenham.