



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**

National Marine Fisheries Service

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**Summary of Peer Reviewer Comments and Response for the Status Review of  
Southeast Alaska Herring (*Clupea pallasii*)**

Between November of 2012 and March of 2013, the draft Status Review of Southeast Alaska Herring (SR) was evaluated through a formal peer review process. During this review, edits and comments were collected from three reviewers, including two research fisheries biologists with particular expertise in herring from the National Marine Fisheries Service Auke Bay Laboratory, in Juneau, AK as well as a herring biologist and Section Head with the Department of Fisheries and Oceans' (DFO) Pacific Biological Station in Nanaimo, BC. All of the comments of these reviewers as well as the response from NMFS PRD staff are included in the following tables. In summary, of the 48 comments made by the three reviewers, 17 included suggestions for additional information or confirmation of existing information, 13 included recommendations for a format change such as shortening a section, 11 included suggestions or questions regarding data analysis/presentation such as the efficacy of trend lines, and the remaining 7 included comments either questioning information in the document or requesting further evidence in support of information. None of the comments on any particular section were shared by the reviewers. NMFS PRD staff responded to all of the comments and added, modified, deleted text from the document or noted accordingly.

K. Savage, Jan. 15, 2014



Topic/Threat	Section	Reviewer Comment	Response
Parameters of Vulnerability		Relative to tropical and some temperate species Pacific herring are slow growing and late maturing fish.	Modified
Habitat Modification		The sections relating to habitat covered much of the available literature but I didn't get a sense of whether this was a threat that should be given much weight. It appears that with a few exceptions (Auke Bay) most of the spawning areas in southeast Alaska remain relatively unaffected by anthropogenic impacts and so habitat alteration poses little risk to herring production and can't really be considered as a threat to the DPS as a whole. If this impression is incorrect I think there needs to be more clarification in the document.	Modified.
	Life History	Tee Harbor June Pelican late June	Modified.
	Pollution	Cruise ship's discharge	Addressed later in document
	Marine traffic and noise	Herring also respond to light, night time acoustic surveys in PWS run with lights out to avoid altering herring behavior	Noted.
	Auke Bay	This really is an amazing case study. However, as this is a status review of all herring across SE, a more comprehensive case study would include the story of Sitka sound here. Above I've highlighted two sections that (1) mention the recent increase in herring biomass, and (2) discuss habitat modification in Sitka sound. Putting this case study into perspective by comparing it to a stock that has opposite trends in abundance may be enlightening to highlight the potential differences that could be contributing to the decline in Auke Bay and the increase in Sitka Sound.	Added.
	Maybe convert this to tons for more direct comparison with catch statistics (e.g., 2,502 tons, or 2,270 tonnes)	Modified.	
Overutilization	Trends in Abundance	I'm guessing that you don't include trend lines when the trend isn't significant. I would suggest including them, because it does give one a feel for the trend, and just note for each plot whether or not they are significant.	Deleted trend lines.
		Consider including a trend line (like I've done below) when Sitka is not included. Also consider a quantifier to "differs substantially". For example, maybe include "the positive slope differs nearly by 4".	Deleted trend lines.
	Recruitment	Consider changing the color and line type of the trend lines to match the data they are trending, it will help differentiate them. Like I've done here...	Deleted trend lines.

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Overutilization	Age-at-maturity	This maturity 'data' are results from the ASA models for these stocks. These same maturity curves are available for any ASA assessed stock (including Sitka). Similar to the preceding figures, you could also plot just Sitka, then the average of the 'other' stocks or something.	Noted.
	Mean length and weight	One question I have is whether the data used in these figures are with the updated ages or the older, uncorrected ages....	Noted.
	Condition Factor	The reason that these slopes are so small is because K is so small, which does not necessarily mean that these differences are practically negligible. If one were to multiply K by 100,000 (like is what appears to have been done in the following figure) these slopes would become much more different than zero...	Removed
		This plot doesn't seem to match the slope coefficients in the following table. Are these slope coefficients reported in the table for Hoonah only from 2002-2008? To be consistent with the other stocks, they should be for the entire time series, which would put them on the same scale.	Removed
		Maybe consider deleting this, doesn't really seem necessary as it kind of goes without saying...	Removed
		The scale of these values doesn't seem correct... For example, in Figure 59 above, average length across years for Sitka herring was around, say, 225 cm. Average weight across years in Figure 60 was around 145 g. K being $W/L^3$ would then be $\sim 1.27E-5$ . It should be noted that the y-axis is on the scale of $10^{-5}$ , or, that K is multiplied by 100,000.	Removed
Disease		The way this reads currently is that the effects of disease has been debated, which is somewhat misleading. The debate is mostly over the magnitude and prevalence of specific pathogens. IMHO I would edit this part of this sentence to something like: "... although the magnitude and prevalence of specific pathogens has been debated..."	Modified
		Also ADFG test fisheries where a lot of fish are captured in a purse seine, a few sampled with the rest being released.	Noted
		We have speculated that the heavy predation by whales during the winter could increase stress and thus disease in PWS.	Modified
		The issue of disease as a threat to herring remains unresolved. Certainly the few studies and attempts to conduct baseline surveys have shown various diseases to be endemic to herring but whether they cause ongoing low to moderate levels of mortality is unclear. It is also difficult to generalize more broadly from the extensive studies in Prince William Sound where herring have continued to experience some level of stress from the oil spill.	Noted

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Predation		Shorten	Shortened
		Unevenly includes marine mammals and piscivorous fish (vs. birds and marine mammals). Requires discussion on uncertainty of estimates of predation.	Depends upon available information
	General predation	A problem for herring is that they aggregate in dense schools during spawning and overwintering, thus even at low population levels the dense schools may still be attractive to predators.	Added
	Cetaceans	Gray whales eat herring and herring eggs in Sitka and PWS. I think sea otters do too	Skip - no documented info provided
	Cetaceans	I believe this is mostly summer work when salmon are abundant. Residents take ground fish from longlines I don't think it is known what they are feeding on in winter.	Modified according to Ford and Ellis 2006
	Humpbacks	In inside waters, Maybe <i>T. Pacifica</i> outside.	Added in inside waters
	Humpbacks	Humpbacks also compete with herring for zooplankton.	Added
	Humpbacks	This is important, some whales seem to specialize in herring or have prey preferences regardless of what alternate prey is available.	Addressed later in document
	Stellers	I think some recent tagging studies may contradict this. During the winter sea lions moved all over SEAK rather than staying at one spot.	Deleted
	Stellers	Check with ADF&G, tagged animals seemed to miss the big herring schools in PWS	Deleted
	Stellers	What about harbor seals? Fur seals use to feed on spawning herring in Sitka	Harbor seal populations are fluctuating throughout Southeast Alaska and have been less well characterized as a herring predator compared to Steller sea lions.
	Inverts, Fish	These fish also compete with herring. Also I saw adult herring feeding on larval/juvenile herring off Eagle Beach.	Noted
	Inverts, Fish	The size of halibut has also been reduced. There aren't many big ones left. There is a hypothesis that the lack of big predators has created a mesopredator release with species like ATF and cod.	Noted
	Predation	ATFs eat herring and I think their biomass is going through the roof	Noted

Topic/Threat	Section	Reviewer Comment	Response
The Inadequacy of Existing Regulatory Mechanisms	Herring fisheries	This 'however' seems out of place. Further, the first sentence doesn't seem to be needed under the 'Herring fisheries' section. You may consider deleting the first sentence, and leading with: "Regulatory mechanisms with the greatest current impact on Southeast Alaska Pacific herring stocks are ADF&G management plans and harvest strategies for exploited stocks."	Modified
	Assessment of abundance	Just added in other sources of data used in the ASA model. Note that in PWS the mile-days of milt is used as an additional index.	Modified
		The way this currently reads, variance estimates were included for all data sources for the first time, which isn't correct. Variance estimates were always used in the ASA model (otherwise you're using VPA or other deterministic methods and treating the data as 'known'). In 2008, annual variance estimates were provided (rather than constant variance across years) for the spawn deposition data, which incorporated uncertainty in the data, not the modeling process. Further, the spawn deposition is data that was weighted, and is not a parameter.	Modified
		This is not entirely correct. The PDO has been used to define time-periods for parameters (which is discussed below). For example, parameters for natural mortality and maturity are estimated within time-blocks of the PDO phases. This is done for all the SE stocks (that are assessed with ASA models) as well as in PWS for maturity. Consider changing this sentence to "The phases of the Pacific Decadal Oscillation index has also been used to define time periods for parameters estimated".	Modified
	Stock assessment	Check this. Usually parameters aren't weighted (except through a penalty function, for example, to dampen recruitment estimates), data is weighted...	Corrected.
Stock identification	So is this statement inferring that herring from other stocks are moving to Sitka? To be honest, it's something that I've postulated to myself several times before, but no analysis I've done indicates that as a possibility (i.e., the decline in other stocks comes nowhere close to the increase in the Sitka stock). IMHO, this seems like a pretty big statement to make without substantiating evidence. This whole section does provide interesting research leading to this possibility. But, consider mentioning that this statement isn't corroborated by any analysis done to date.	Modified	

Topic/Threat	Section	Reviewer Comment	Response
The Inadequacy of Existing Regulatory Mechanisms	Data collection methods	<p>These statements are out of context here. The Thomas and Thorne (2003) study was for PWS herring. Further, Hulson et al. (2008) showed that the same results can be found with the ASA model, depending on the weighting of the datasets. The main issue in PWS in the late 1980s and early 1990s was that there was a conflict between the mile-days of milt (which was the index that Thomas and Thorne (2003) used, not ‘miles of beach spawning’, which they mis-define in that study), and the spawn deposition datasets. Depending on which dataset one weights higher (either the mile-days or spawn deposition) the decline either started in 1988 or 1992. In other words, if one were ignore all the other sources of information for PWS herring other than the mile-days of milt, the same results occur as Thomas and Thorne (2003). Further, ADF&amp;G pre-fishery monitoring on the fishing grounds did not detect the collapse until 1993, which follows the results of the spawn deposition survey. If these statements are to remain it should be noted that: (1) they apply to PWS, and (2) Hulson et al. (2008) also highlights a number of inadequacies of the Thomas and Thorne (2003) study, including the assertion that the ASA model consistently overestimates.</p>	Corrected.
	Modeling	<p>I read this above also. IMHO it’s not so much that we can’t express them in mathematical form, it’s that we don’t have the observations that support more complex mathematical convention.</p>	Noted
		<p>In the ADF&amp;G herring models, parameters aren’t weighted, data is.</p>	Corrected.
		<p>Not sure exactly what is meant here. There are only a limited number of models that implement M. For example, surplus production models don’t use M, but use carrying capacity, productivity, and a shape parameter. VPA and ASA do, but results from either structure of model would be similar depending on the choice of M. Further, the remainder of this paragraph deals with the value and form chosen for M. Thus, I would suggest omitting ‘the model used’ from this sentence and state that it has to do with the value and form chosen for M.</p>	Corrected.
		<p>The sections on overutilization of herring fisheries, stock assessment and natural mortality seemed to be too long and somewhat unfocused. It seemed like there was a lot of material available so it was all included but I didn’t get a sense of the main points and conclusion that were to be drawn from this section. Perhaps that will be clarified in the Extinction Risk Analysis.</p>	Corrected.

Topic/Threat	Section	Reviewer Comment	Response
Other		Shorten	Modified
		<p>The sections on climate change, risk due to acidification and regime shifts seem too speculative to be useful for assessing extinction risk. I question whether climate change should really be considered as a threat since it isn't something that can be readily mitigated. I think the pertinent question is whether herring will be able to adapt to changing climate rapidly enough to persist in this region. Similarly, although regime shifts have occurred in the past with significant effects on herring production in British Columbia and presumably Alaska, it is unclear how or if they will persist over and above the effects from global warming to the extent that they will continue as drivers of productivity over extended periods of time.</p>	Noted
	Anthropogenic climate change	I believe there is some OA work on the pteropod <i>Limacena helicina</i> really important to herring and salmon in our waters	Noted