



Pacific Herring (*Clupea pallasii* Valenciennes 1847)

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A Bibliography of Scientific Literature on Pacific Herring (*Clupea pallasii*), with Additional Selected References for Baltic Herring (*Clupea harengus*)

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Science Assessment &
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Introduction

Pacific herring (*Clupea harengus pallasii* Valenciennes) support an important commercial roe fishery and sportfishery in San Francisco Bay. Because of their economic and recreational value, there are significant management efforts in place to maintain the health and abundance of the San Francisco Bay herring. The CA Department of Fish and Game (DFG) manages the fishery based on an extensive research program that collects data to assess the herring population on an annual basis. This data is used to set quotas and gauge the overall health of the population, which helps guide the regulation of this important fishery resource.

There has recently been some concern about the potential effects of dredging and dredge materials disposal on herring spawning activity and on the hatching and survival of the eggs and larval fish (Turner 1993). This has resulted in the implementation of a “fish window” for herring that prevents or limits dredging activities in Central San Francisco Bay (and Richardson Bay) from December 1 through February 28. Ideally, all of the necessary dredging in San Francisco Bay could be completed consistent with this fish window. However, logistical problems such as variable weather and the availability of the dredgers can make this difficult to accomplish.

Fish windows are based upon available scientific information. And while scientists have generated and collected an abundance of data on Pacific herring, there is little known available information regarding the effects of dredging activity, sediments, and related contaminants on herring spawning and herring early life stages in San Francisco Bay. As a result, there is some degree of uncertainty whether or not the limits imposed by the ‘windows’ are indeed protective or necessary to maintain the health and well-being of the herring population.

As a first step towards addressing this issue, the Long Term Management Strategy (LTMS) Science Assessment and Data Gaps Workgroup Herring Subcommittee has identified a compilation and assessment of the available scientific information regarding Pacific herring as an important data gap. To address this need, the U.S. ACOE has contracted this compilation of a bibliography of scientific publications relevant to the determination of effects of dredging-related sediment suspension and sediment-associated contaminants on the spawning and early life stages of Pacific herring. It is expected that this bibliography will serve as a resource to facilitate subsequent research efforts that may follow.

The body of scientific publications addressing some aspect of Pacific herring is considerable. In identifying articles appropriate for this bibliography, a certain degree of selectivity was employed to target key areas of interest: the biology and ecology of herring spawning and early life stages, the effects of suspended sediments/particulates and contaminants on herring spawning and early life stages, and methodologies for performing research using herring early life stages. However, additional papers dealing primarily with herring fishery management were also included where it was felt that some of the information within the paper might be of interest to the LTMS participants. While the number of scientific publications addressing Atlantic (or Baltic) herring is not quite so voluminous as for the Pacific herring, there is nevertheless a considerable body of information; selected articles dealing with Atlantic herring, where the subject of the paper was targeted directly towards the current areas of interest, are included at the end of this bibliography.

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