DISEASE SUSPECTED TO LIMIT HERRING RECOVERY

PRINCIPAL INVESTIGATORS

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RESEARCH PERIOD

2009-2017, 2017-2022

FUNDING

Exxon Valdez Oil Spill Trustee Council

This project is part of the *Herring Research and Monitoring* program. The purpose of this study is to improve predictive models of herring stocks in Prince William Sound through observations and research.

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BACKGROUND

Infectious and parasitic diseases are suspected of limiting the recovery of Pacific herring in Prince William Sound (PWS). Paul Hershberger and Maureen Purcell (USGS) are leading a team of researchers in exploring the prevalence and intensity of diseases and how they are transmitted in PWS herring. Of particular interest are viral hemorrhagic septicemia virus (VHVS) and *Ichthyophonus* parasite. Herring undergoing active VHS disease are often lethargic and demonstrate external hemorrhages around the eyes, mouth, and fins. *Ichthyophonus* can kill herring directly or cause chronic infections that result in fish with decreased condition, decrease swimming performance, and decreased ability to avoid predators.

Herring showing signs of VHS.

METHODS

Through field studies, researchers hope to better understand the prevalence of disease and infections in PWS herring, as well as in Sitka and Puget Sound. Lab studies will shed light on the relationships between the host, pathogens, and environmental conditions. For example, can pre-exposure to VHS help anticipate future disease outbreaks? Does change in water temperature change the virulence, or harmfulness, of the pathogens?

WHAT WE WILL LEARN

New techniques developed for detecting antibodies formed in response to exposure to VHS virus are providing us with a better ability to detect the effects of this disease that can spread rapidly through the herring population. We have also demonstrated pathways for exposure to *Ichthyophonus*. Our continued work will focus on evaluating how the available disease information can be applied for determining the number of herring killed during disease events. We will also be examining the transmission of *Ichthyophonus*. The intent is to learn how best to incorporate the disease information in the numerical models used to predict herring populations.

Herring with signs of Ichthyophonus.