



Prince William Sound Herring Survey: Top-down Regulation by Predatory Fish on Juvenile Herring

PRINCIPAL INVESTIGATORS

Mary Anne Bishop, Ph.D.
PWS Science Center
mbishop@pwssc.org

Sean Powers, Ph.D.
University of South
Alabama, Dauphin Island
Sea Lab
spowers@disl.org



RESEARCH PERIOD

2009-2013

FUNDING

Exxon Valdez Oil Spill
Trustee Council

This project is part of the *Prince William Sound Herring Survey*. The purpose of this comprehensive study is to better understand the factors limiting the recovery of the Pacific herring in Prince William Sound, Alaska.

Prince William Sound
Science Center
PO Box 705
300 Breakwater Ave
Cordova, AK 99574

907.424.5800

www.pwssc.org

BACKGROUND

Herring are an important part of the marine food web in Prince William Sound. They are preyed on by many species of fish, especially Pacific cod, walleye Pollock, and Pacific halibut. Juvenile herring are especially vulnerable to predation in winter, when their growth rates and energy levels decrease, suppressing their ability to avoid predators. This may contribute to the high mortality of Prince William Sound herring in their first winter. The amount of predation also depends on several other factors including the abundance of predators, the density of juvenile herring schools, and the availability of alternative prey species.



METHODS

Researchers are conducting studies of predatory fish found near schools of herring during research cruises in March and November. In conjunction with acoustic surveys to determine herring abundance, researchers use a longline (above) and gillnets to capture, count, and identify predatory fish nearby. Stomach contents from the fish are analyzed to determine what they are eating, and the amount and proportion of herring to other prey species.

WHAT WE WILL LEARN

This study will identify the major fish species that prey on juvenile herring, how predation may change throughout the winter, and what effects habitat characteristics may have on patterns of predation. We will learn how predatory fish respond to



A fish stomach containing herring.

different concentrations of juvenile herring, and whether they switch to other types of prey when those are available. The data will help fisheries managers develop better models of herring recruitment. In the future, these results may also help identify sites for future herring supplementation efforts and enable researchers to provide recommendations for other ways to manage the herring population.