

# Acoustic telemetry arrays to track fish movements within Prince William Sound, AK

*A project of the Prince William Sound Science Center, P.O. Box 705, Cordova, AK 99574—[www.pwssc.org](http://www.pwssc.org)*

## **Project Description:**

Since 2007 the Prince William Sound Science Center (PWSSC) has used passive acoustic telemetry as a means to track fish movements. The use of acoustic telemetry has allowed fisheries ecologists at PWSSC to monitor residency and seasonal migrations patterns of several commercially important fish species including Pacific herring, Pacific cod, lingcod, and copper rockfish. To track fish movements, coded acoustic transmitters are surgically implanted into target species. These acoustic tags transmit an individual identification code, sensor and time/date information to the underwater receivers which record the telemetry data and transmit stored data to a surface unit on demand.

The use of acoustic telemetry allows us to continuously monitor the presence or absence of tagged fish over the course of several years. This allows PWSSC researchers to discern movement patterns on temporal and spatial scales that are relevant to management while filling in significant gaps in what is currently understood about regional fish stocks. Our arrays will also track fish or marine mammals with compatible tags placed by other researchers. We will then supply any detection information to the scientists who tagged the subject no matter where in the world the tag originated.

In April 2017, the Science Center began a 5-year study to tag and monitor Pacific Herring. Currently, as part of LAS permit #27065 the PWSSC has an underwater array deployed in Port Gravina, an important herring spawn area. In addition, the PWSSC maintains a larger network of receivers located across the major entrances between the Gulf of Alaska and Prince William Sound. The network of receivers at the entrances to Prince William Sound was established in March 2013 (LAS permit #28164) as part of a long-term collaboration with the Ocean Tracking Network.

As part of the attached permit application, we will establish acoustic receiver arrays at herring spawning sites outside of Port Gravina. Based on recent herring spawning behavior, we predict that herring will spawn at Canoe Pass, Port Fidalgo, or along the northwest side of Montague Island at sites between and including Rocky Bay to Port Chalmers. Acoustic arrays placed on the spawning grounds will allow us to determine when herring depart from the spawning grounds, and if herring return to the same area the following spring.

## ***Details regarding receiver deployment and retrieval***

We will maintain two multi-receiver arrays in herring spawning areas. The first array is currently in place in Port Gravina (permitted under LAS #27065), an area where herring have been spawning regularly the past several years. We will also deploy a receiver array at a second, major herring spawning site outside of Port Gravina. Based on historic spawning behavior, we estimate that the second array will be deployed at Port Fidalgo (see Fig. 2A), the entrance to Canoe Pass (see Fig. 2B) or northwest Montague Island (see Fig. 2C).

Each receiver will be secured to the benthos via subsurface moorings and accompanied by a ball float to minimize tilt (Fig. 3). These receivers require yearly refurbishment and have either built-in release

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mechanisms (Vemco VR2AR) or in the case of the Vemco VR2W, a separate acoustic release allowing them to be serviced and downloaded at the surface. At the conclusion of the study, all receivers will be recovered and removed from marine waters.

### **Project Coordinates**

**Note:** Each time a receiver is deployed a record of its location and depth is filed with the United States Coast Guard as part of the *Notice to Mariners*.

**DEPLOYMENTS PLANNED FOR late March, early APRIL 1 2018 (FINAL LOCATION DEPENDS ON HERRING SPAWNING SITES in 2018 and 2019):**

**Port Fidalgo** - (General location of potential array; 60.79, -146.47) – up to 9 receivers; exact receiver locations will depend on 2018 or 2019 herring spawning site

**Canoe Pass** – up to 5 receivers (general location 60.5, -146.15)

**northwest Montague Island** – up to 9 receivers deployed; exact receiver locations will depend on 2018 or 2019 herring spawning site but will most likely be at or between Rocky Bay and Port Chalmers.

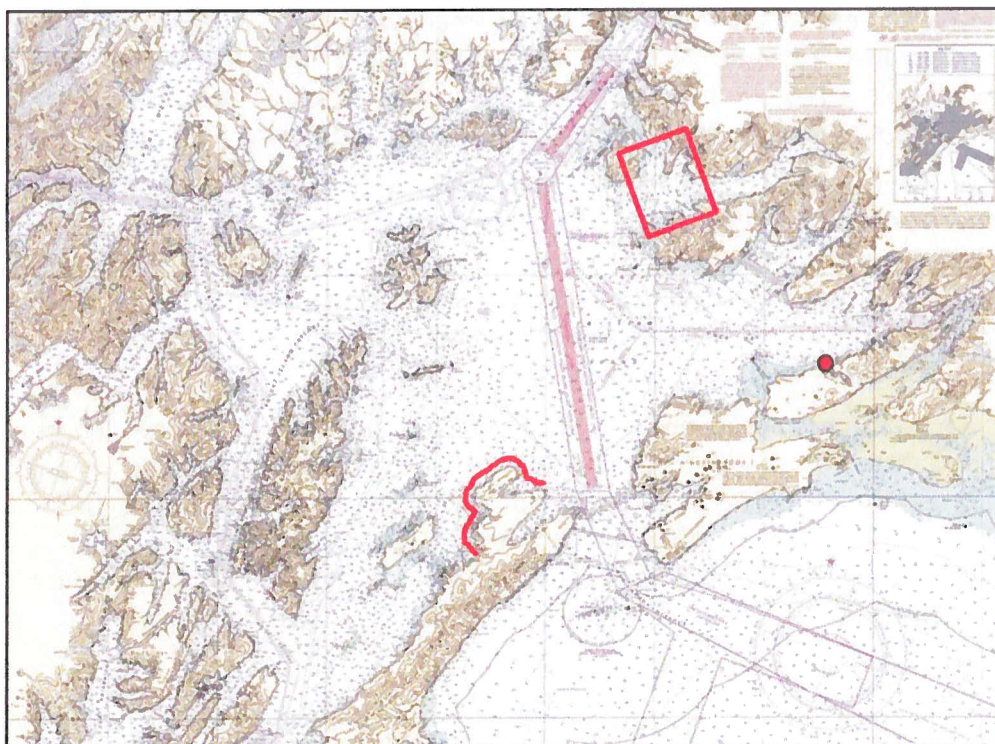
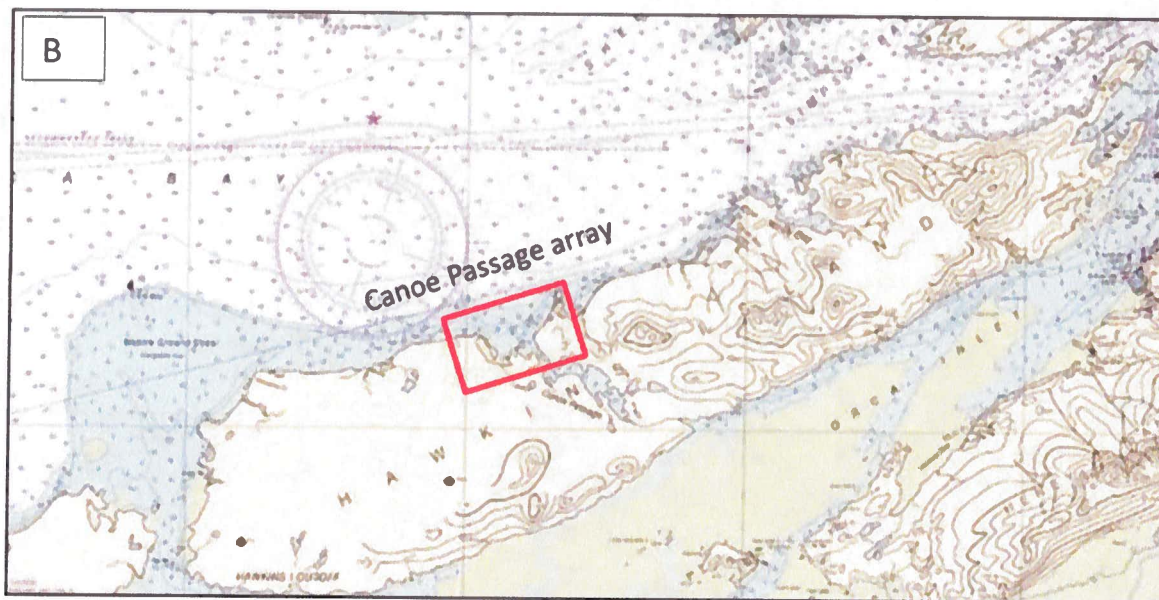


Figure 1. General locations, throughout Prince William Sound, of proposed underwater acoustic receiver arrays (signified by red lines/dots) in herring spawning areas. Exact locations will depend on year and location of herring spawn.

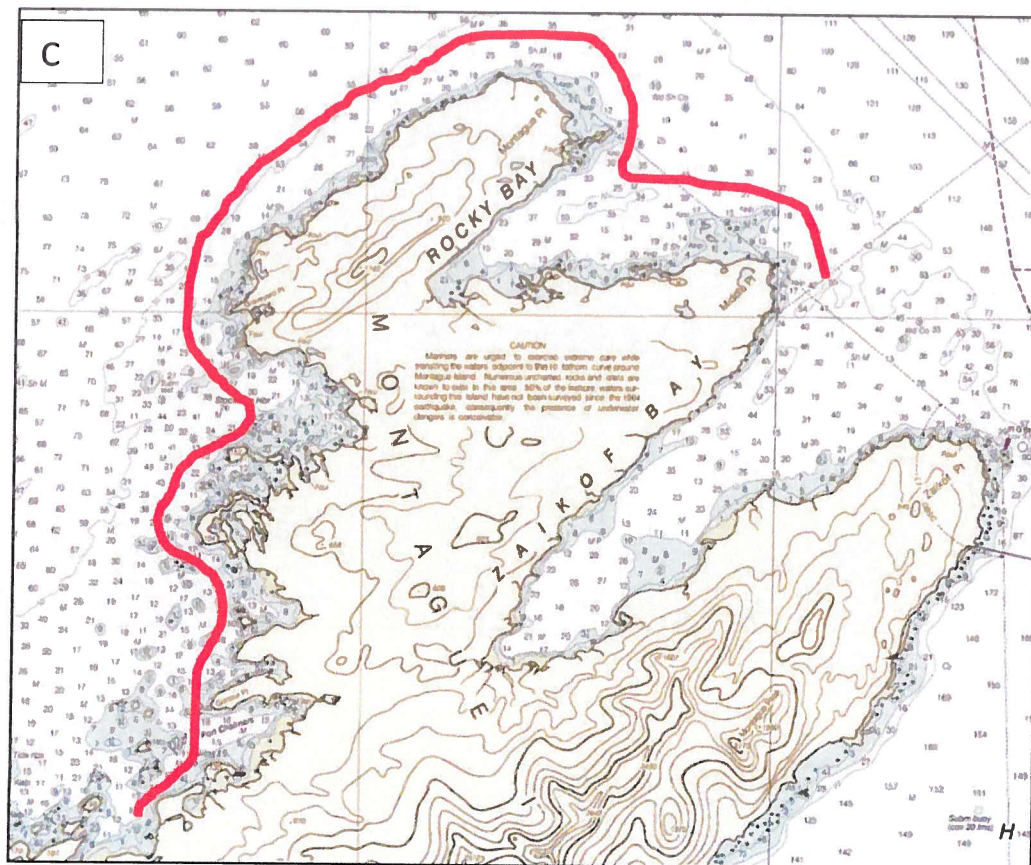
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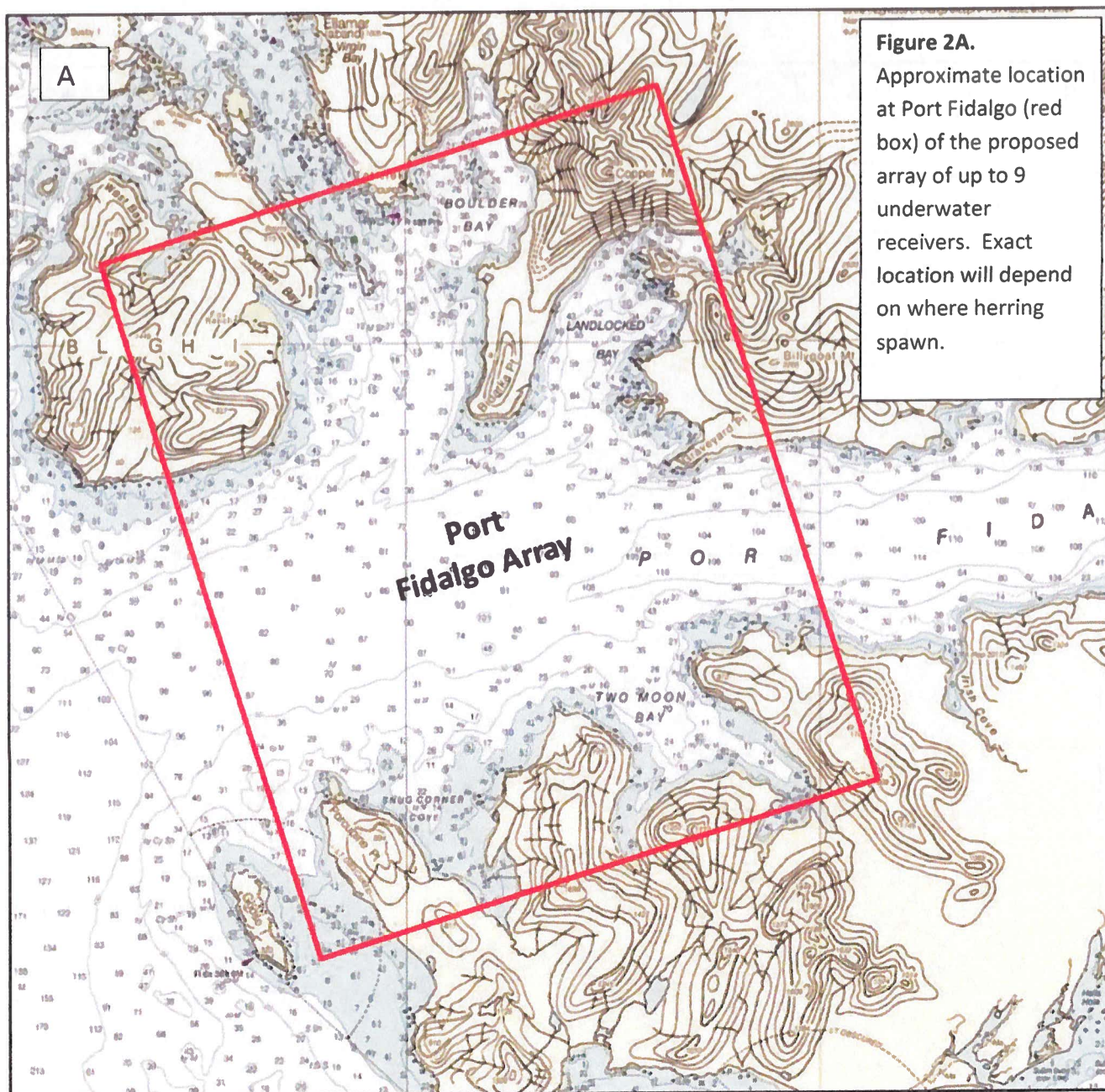


**Figure 2B.**  
Approximate  
location of the  
proposed  
array of  
receivers to be  
placed at  
Canoe passage  
(red box)



**Figure 2C.** General  
location at northwest  
Montague Island  
(red line) where a  
proposed array of up  
to 9 underwater  
receivers will be  
placed. Exact  
location will depend  
on where herring  
spawn.





**Figure 2A.**  
Approximate location  
at Port Fidalgo (red  
box) of the proposed  
array of up to 9  
underwater  
receivers. Exact  
location will depend  
on where herring  
spawn.

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### Acoustic Receiver Moorings

Receiver arrays deployed will each contain VR2AR or VR2W receivers. These receivers will be moored with approximately 100 lbs of boom chain and a 16" Hardball syntactic foam float (Deepwater Bouyancy) (Fig. 3). Receivers will tether to a mooring base with 3/8" Spectra and to flotation with 5/16" Spectra. Riser lengths will be at least 16' or 10% of the mooring depth for moorings that exceed 326' depth (Fig. 3).

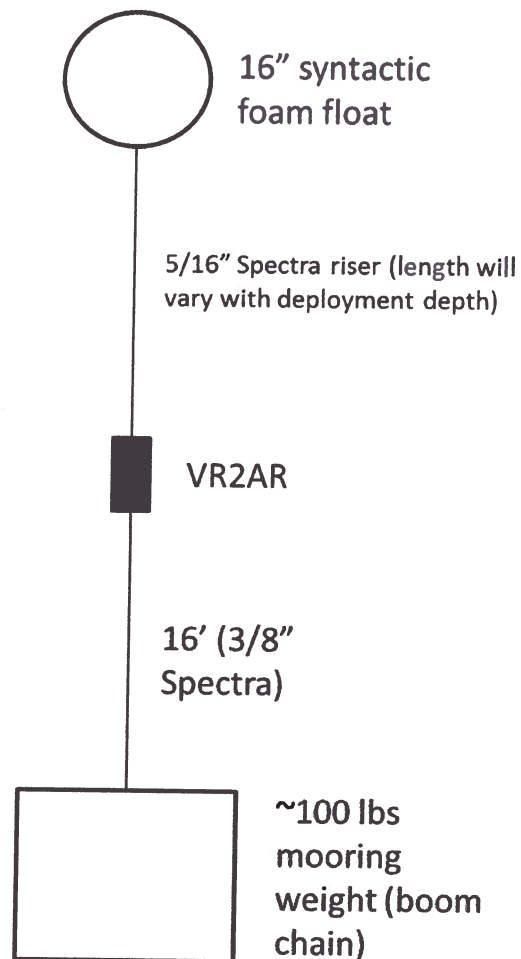


Figure 3. Depiction of a typical VR2AR mooring with a built-in acoustic release mechanism. VR2W's are moored similarly, but are attached to a separate acoustic release device.

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