

Acoustic telemetry arrays to track fish movements within Prince William Sound, AK; Permit renewal for #27065

A project of the Prince William Sound Science Center, P.O. Box 705, Cordova, AK 99574—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. To date, 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.

This LUP application is to renew LAS #27065. Currently, as part of permit #27065 the PWSSC has an underwater array deployed in Port Gravina. 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 28164) as part of a long-term collaboration with the Ocean Tracking Network.

Details regarding receiver deployment and retrieval

The first array is currently in place in Port Gravina (Figs. 1 and 2A), an area where herring have been spawning regularly the past several years. Under this permit, we will add two additional receivers just south of Port Gravina near Redhead (Figs. 1 and 2A). Also, as part of a study of pollock movements, we will redeploy a small array of 4 receivers across the entrance to Lower Herring (Figs. 1 and 2B). In addition, a series of single receivers will be placed in various locations in Orca Inlet (4 locations; Figs 1 and 2C).

Each receiver will be secured to the benthos via subsurface moorings and accompanied by a flotation collar or ball float to minimize tilt (Figs. 3 and 4). Receivers which require yearly refurbishment (VR2AR's) have built-in release mechanisms allowing them to be serviced and downloaded at the surface. In the case of VR3 receivers to be deployed near Redhead, receivers will be downloaded remotely in the field via a surface modem and transducer. At the conclusion of the study, all receivers will be recovered and removed from marine waters.

Nov 1, 2017

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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 a *notice to mariners*.

RECEIVERS ALREADY DEPLOYED AS PART OF #27065:

Port Gravina – 10 receivers currently located between (60.67 – 60.69°N, -146.39 – -146.40°W)

RECEIVERS TO BE DEPLOYED

Lower Herring Bay – 4 receivers (60.380688, -147.850632; 60.377979, -147.852059; 60.379337, -147.845877; 60.377474, -147.846873)

Orca Inlet – 4 receivers; Hawkins cutoff (60.46667, -146.34501), and 3 others (60.399795, -146.049813; 60.509958, -145.976649; 60.588843, -145.753047)

just south of Port Gravina - 2 receivers near Red Head (60.61636, -146.62354; 60.636153, -146.497296)

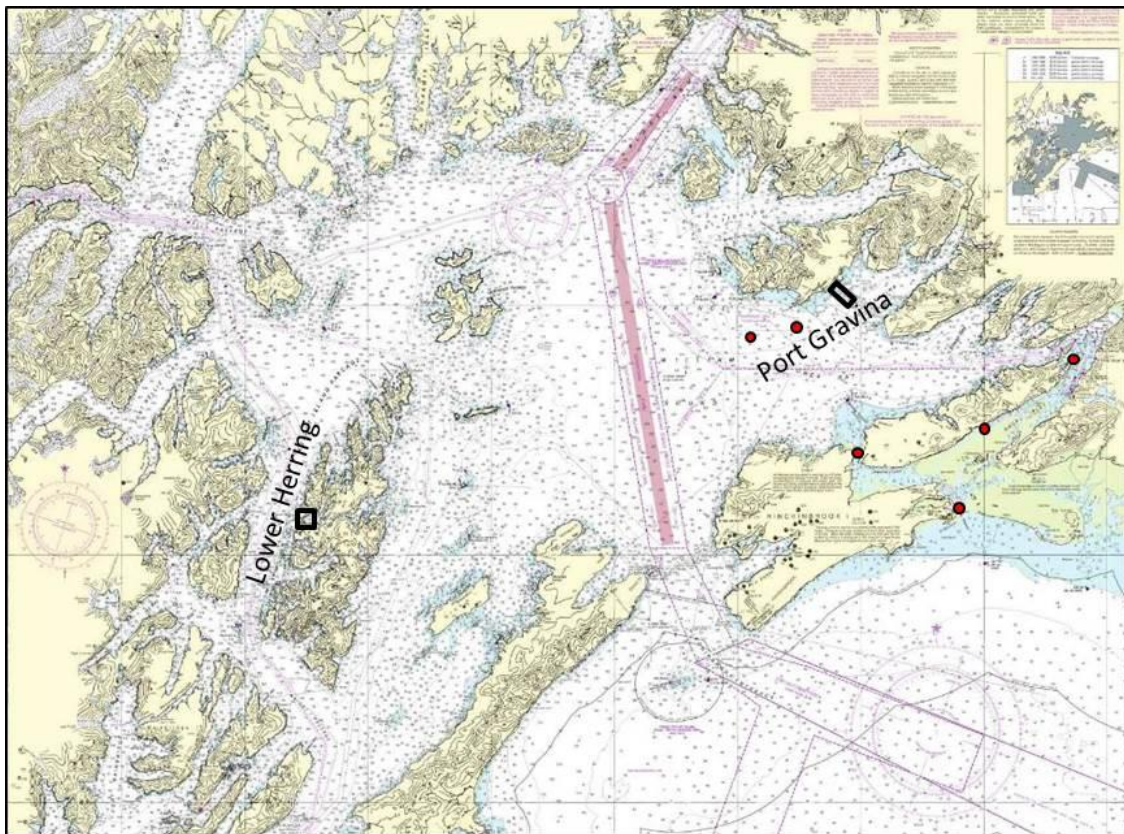


Figure 1. General locations of proposed underwater acoustic receivers (signified by red dots) throughout Prince William Sound, Alaska. Black boxes represent areas where an array of receivers are either currently in place (Port Gravina) or will be redeployed (Lower Herring).

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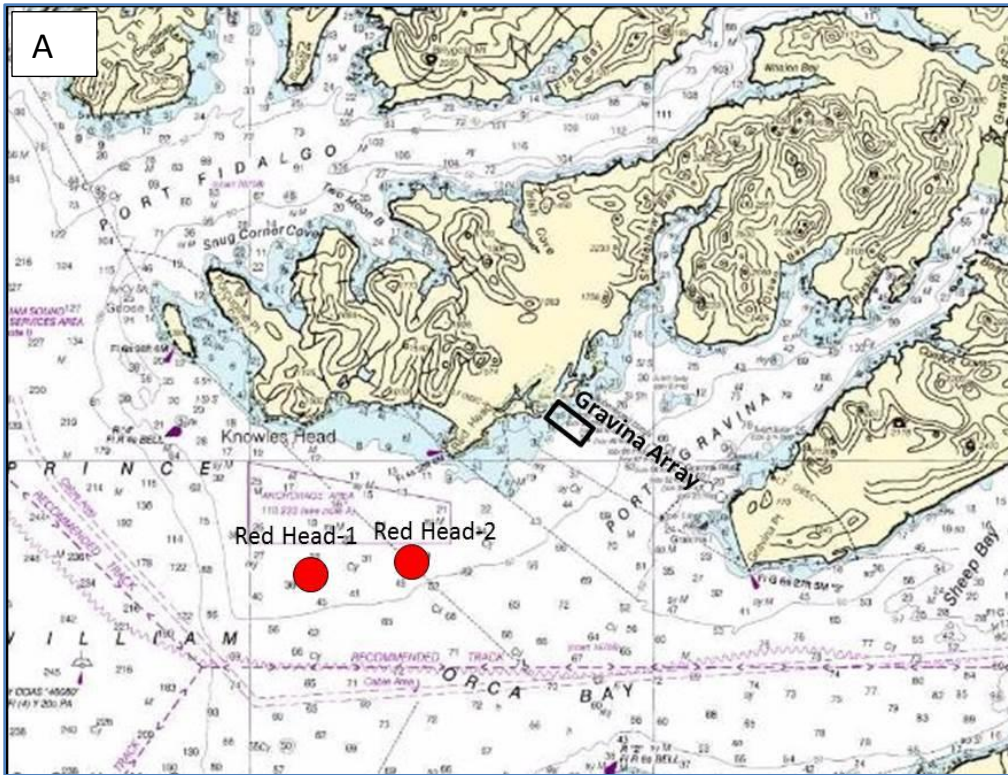


Figure 2A Port Gravina array location (black box) includes 10 receivers. Receivers to be deployed south of Port Gravina are denoted by red dots.

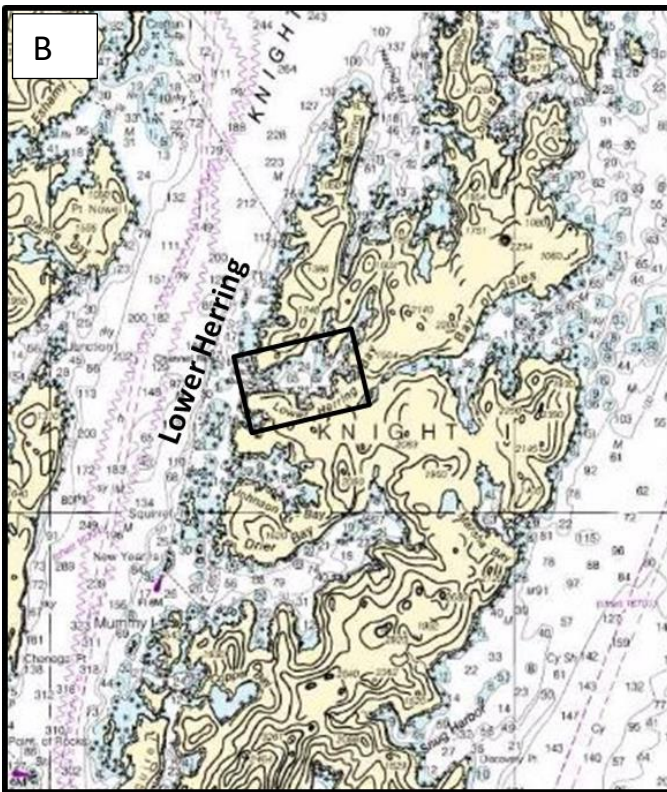


Figure 2B. Location of Lower Herring array (black box). These receivers are not currently in place, but will be deployed.

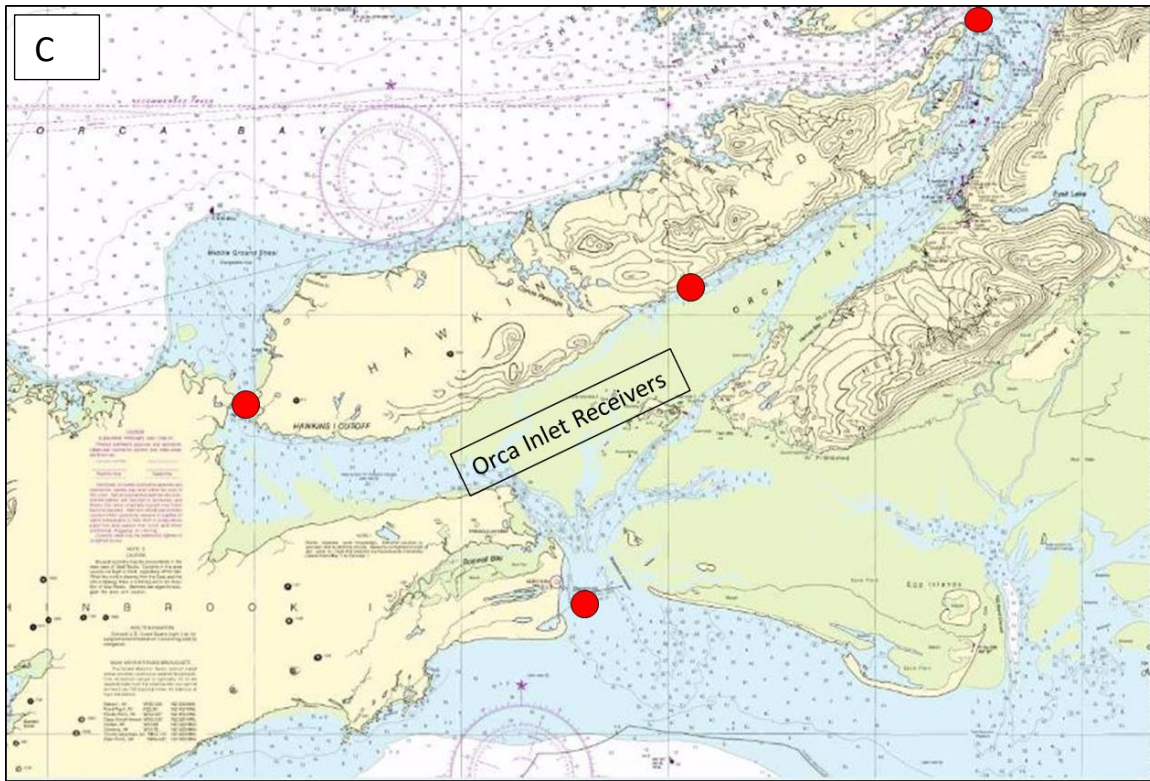


Figure 2C.
Location of receivers within Orca Inlet. These receivers are not currently in place, but will be deployed

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Acoustic Receiver Moorings

Receiver type and associated mooring design will vary by location. Receiver stations at Redhead (s. Port Gravina) will consist of a VR3 acoustic receiver with 220 lbs of boom chain as a mooring weight. These receivers are fit with specialized “flotation collars” (Kintama Research) to minimize tilting (Fig. 3A and 3B). All other arrays will consist of VR2AR receivers. These receivers will be moored with approximately 100 lbs of boom chain and a 16” Hardball syntactic foam float (Deepwater Bouyancy) (Fig. 4). Both VR3’s and VR2AR’s will tether to a mooring base with 3/8” Spectra. The VR2AR’s will connect 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. 4).

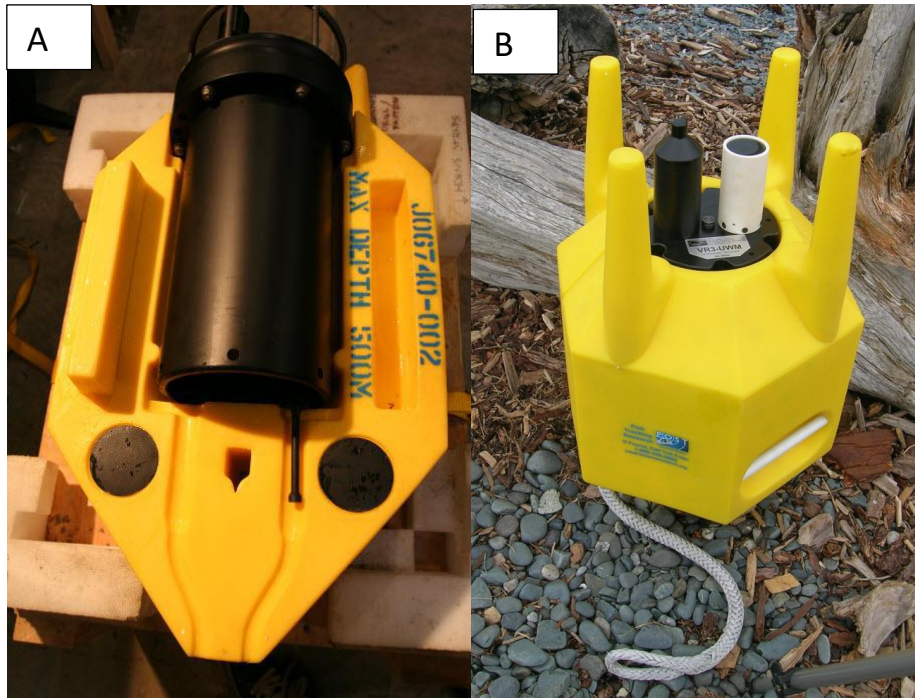


Figure 3. (A) Picture of a VR3 acoustic receiver. (B) Depiction of the receiver and flotation collar.

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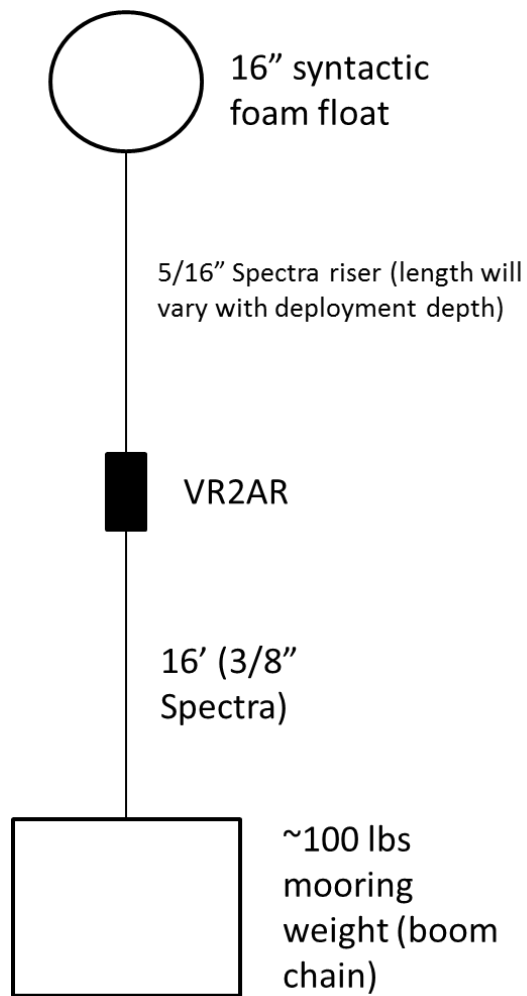


Figure 4. Depiction of a typical VR2AR mooring. VR3 moorings will be similar, however, instead of a riser with a 16" float, the VR3's have a specialized "flotation collar" as seen in Figure 3a and 3b.