



V3D 307 kHz Predation Transmitter

Detect if your tagged fish has been eaten by a predator!

Smaller Fish, More Species

Weighing just under 0.3 grams and measuring 15 mm in length, the V3D predation tag is among the smallest of VEMCO's line of miniature coded transmitters. The V3D predation transmitter helps researchers to better understand predation-prey relationships, and track and monitor smaller fish and a broader range of species than ever before!

How Does the V3D Predation Tag Work?

The V3D predation tag provides a direct measure of digestion wherein stomach acids digest a polymer. Once the prey is ingested by a predator, the stomach secretes acid and begins the process of breaking the food down. At some point along the digestion process, a biologically inert polymer on the tag is digested and the tag immediately changes its Identification Code. The new code is transmitted by the tag until the end of tag life. Triggering time, referred to as the time from prey ingestion to the time of the change of ID, is largely a function of temperature and typically



ranges between 3 and 5 hours (see diagram on page 2 as well as details in the following publication).

Publication Citation and Web Link

Halfyard, E. A., Webber, D., Del Papa, J., Leadley, T., Kessel, S.T., Colborne, S.F. and Fisk, A.T. (2017), Evaluation of an acoustic telemetry transmitter designed to identify predation events. *Methods Ecol. Evol.* Accepted Author Manuscript. doi: 10.1111/2041-210X.12726

Physical Specifications

Frequency (kHz)	307
Diameter (mm)	4
Length (mm)	15
Weight in air (g)	< 0.3
Power Output (dB re 1uPa @1m)	141
Battery	Lithium Micro
Trigger Time (hrs)	3-5*

* Temperature dependent

Applications

Validating Mark Recapture Survival Models

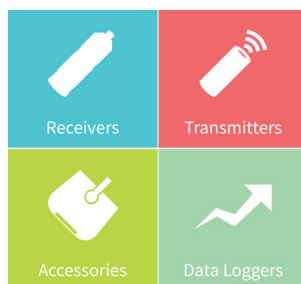
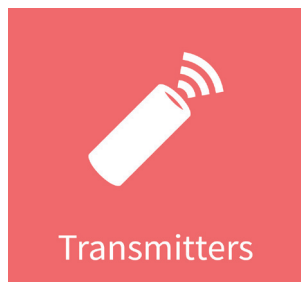
Separating Tag Mortality from Natural Mortality

Investigating Impacts of Invasive Predators on Native Species

Trophic Energy Transfer on Reefs

Investigations into Predator-Prey Behavior

dominance • prey selection • genetic characteristics
prey detection distance • water quality impacts on predation success



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HR3 Receiver

The V3D transmitter is compatible with VEMCO's new HR3 receiver. The HR3 is capable of very precise signal timing which makes it ideal for anyone interested in accurate spatial 2D/3D positioning with sub-meter resolution. Many tagged animals can be tracked in a short period of time, or have their movements tracked as they move quickly through acoustic gates (i.e. river survival study). Using a VR100 and VHTx- 307 hydrophone, HR3 receivers can be communicated with, to query things such as tilt, temperature, battery usage, memory used, and detection count.

Two Transmission Options

The V3D predation transmitter provides two transmission options for researchers.

High Residence (HR) coding represents a more aggressive transmission system than traditional PPM coding and offers the ability to detect many more tagged animals at once. Each HR ID

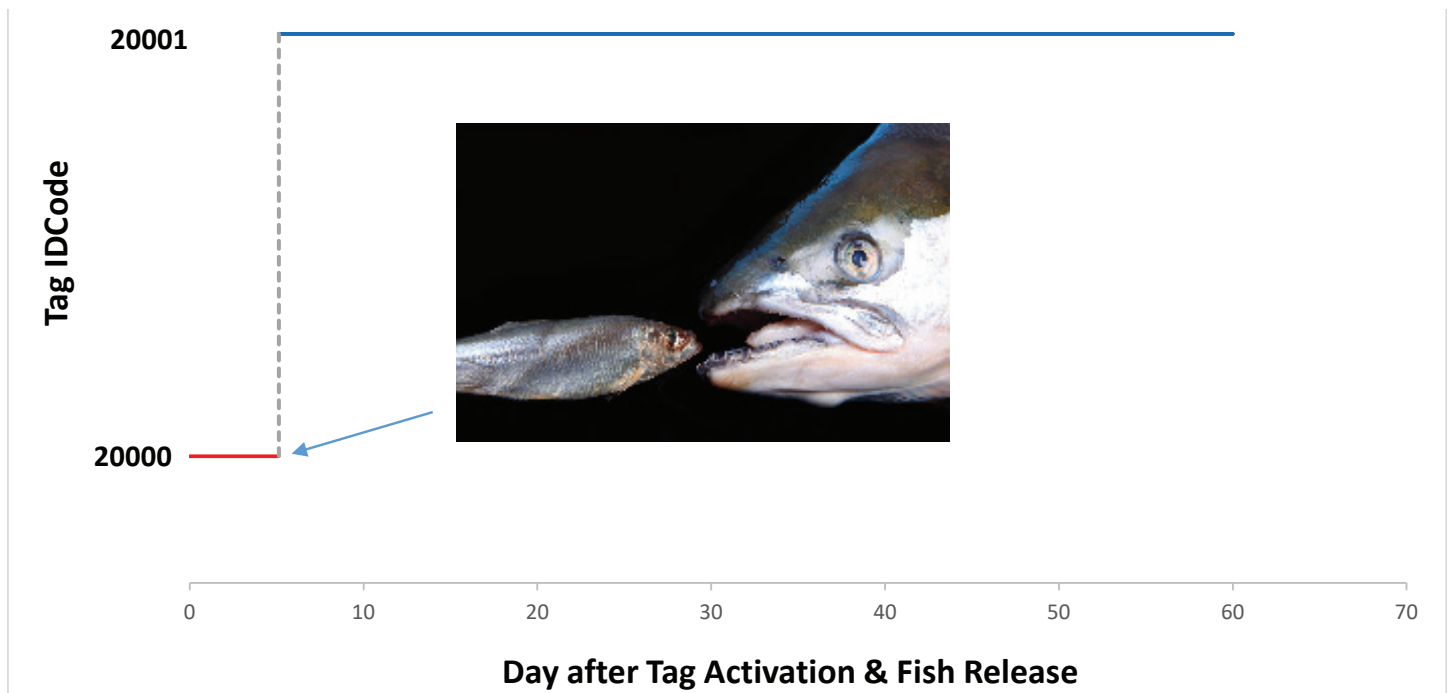
code is embedded in each short ping transmitted by the tag. This allows the HR3 receiver to detect many IDs in a short period of time.

The HTI coding structure provides researchers with high performance in noisy and reflective environments. Alternating HTI and HR coding schemes provide researchers with interesting study possibilities that previously weren't possible, in a tag designed for very small fish.

Advantages of VEMCO's 307 kHz Product Line

- ▶ Two transmission systems (HR and HTI) in one tag provides flexibility for study designs and research objectives
- ▶ Real time or autonomous monitoring of HR and HTI tags
- ▶ HR and HTI transmission systems available in all 307 kHz tag models
- ▶ Able to transmit HR, HTI, or both signals alternating
- ▶ Better understand predator-prey interactions

V3D Predation



U.S. Patent No. 9,526,228
U.S. Patent No. 9,095,122 B2
European Patent No. 3,114,185
China Patent No. 2015 8001 2483.X
Canadian Patent No. 2,845,230
Japan Patent No. 6590993