

MEMORANDUM

TO: PROFESSOR KAREN THOMPSON
FROM: WESLEY FIELD
SUBJECT: TECHNICAL DESCRIPTION
DATE: 30 NOVEMBER 2012

This memo is describing how a rotary screw trap works. Rotary screw traps are an important way to quantify juvenile steelhead (*Oncorhynchus Mykiss*) and chinook salmon (*Oncorhynchus tshawytscha*) populations as they out migrate to the ocean.

Audience

This is directed to help the general public in the Pacific Northwest to help identify a rotary screw trap in local rivers.

Purpose/Problem

The purpose is to help the general public understand how a rotary screw trap works and is used in managing fisheries in the Pacific Northwest.

Placement

This technical description is to be published in a general scientific magazine such as Nature or Science.

What is a Rotary Screw Trap (RST)?

A RST is a type of fish trap used to capture out migrating salmonids (e.g. chinook salmon and steelhead) on their way to the ocean. RST are used to help estimate the population, length, weight, and condition factor (a comparison of weight to length) of emigrating salmonids. This information is used by fishery managers to look at the condition factor of individuals/subpopulation/population of a species, how fast individuals are moving by mark recapture events, and collect data on other native fishes in a watershed that are captured by a RST. (Refer to figure 1)

How Does a RST Work?

A RST consists of a cone covered in perforated plate that is mounted on a pontoon barge. Within the cone it is similar to an auger called tapered flights. The trap cone is oriented with the wide end facing upstream and uses the force of the river acting on the tapered flights to rotate the cone about its axis. Fish migrating downstream are swept into the wide end of the cone and are gently

pushed into a live box (holding tank) at the rear of the trap. A small drum screen, powered by the rotating cone or a paddle wheel, may be located at the rear of the live box to remove organic debris (Volkhardt et al.). (Refer to figure 2)

How are Captured Fishes Processed After Being Captured in a RST?

RST are checked at least once daily, usually in the morning. During peak emigration times, the RST is checked multiple times during the day. The RST operator will check the holding tank to see if there has been any fish captured. Captured fish are netted from the holding tank and placed in an aerated bucket filled with water. Any captured salmonid is checked for a pit tag using a pit tag reader (refer to figure 3). If a pit tag is found, then a new weight (g) and length (mm) are recorded. If a fish does not contain a pit tag it will be anesthetized to insert a pit tag into the abdominal body cavity, and then record a length and weight. Anesthetized fish will be placed in a holding tank after all data is collected. This allows the fish to recover from the anesthesia before being released downstream of the RST. All data that is collected is then entered into ptagis. Ptagis is an online database that contains information on several species of fish that have been marked with a pit tag. For more information on ptagis go to this website <http://www.ptagis.org/>.

Appendix 1



Figure 1- An operating screw trap

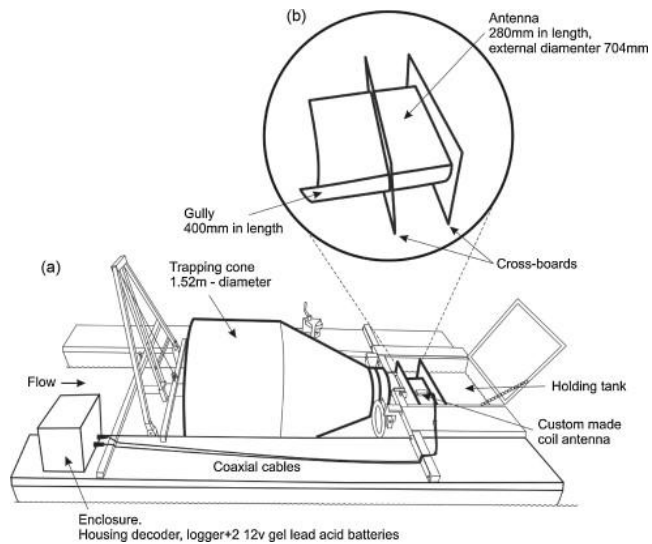


Figure 2- A diagram depicting the parts of a screw trap.



Figure 3- Left- An example of a pit tag reader (yellow circle). Left- Examples of the different sizes of pit tags used for various fish species.

Works Cited

Volkhardt, Gregory C. et al. State of the Salmon. 25 September 2012

<http://www.stateofthesalmon.org/fieldprotocols/downloads/SFPH_p8.pdf>.