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Application of coded wire tagging technology in Pacific herring to investigate stock structure and migration

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Tagging of Pacific herring in British Columbia to understand stock structure and mixing rates of populations using internal metal tags and external Floy tags has a long history dating to the mid-1930s. Unfortunately, uncertainty in some tag recovery locations and low rates of tag return limited the utility of these studies. In 1999, a new tagging program was initiated employing coded wire microtags to mark Pacific herring on the spawning grounds to monitor the movement and mixture of fish interannually. Tank experiments indicated high rates of survival and low tag shedding rates, and field trials indicated the feasibility of cost effective application of large numbers of tags during the short spawning season (250,000 tags applied over 28 days). Methodologies for capturing, holding, tagging, and releasing tagged herring were developed. Tank experiments also investigated the effects of the location of tag insertion and anaesthetic on short-term (3 months) survival and tag retention. Tag detection tubes designed for recovery of tagged Pacific salmon were adapted to detect and recover Pacific herring in fish plants during roe extraction processing. Tag recovery rates of 1–2 % in 2000 from the 1999 releases greatly exceeded the returns from previous tagging programs. Tag returns indicated a high degree of homing or fidelity to the area of release, but also produced a number of remarkable strays. Coded wire tagging technology appears to provide a useful tool for large-scale marking experiments on smaller pelagic species and should have broad application for stock structure and mark-recapture studies.

Keywords: coded wire tags, mortality, recovery, stock structure, tagging.

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Experiments on tagging mortality and shedding in captive Norwegian spring spawning herring: effects of tagging season and tag type

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Tagging of Norwegian spring-spawning herring is traditionally carried out with steel tags (20x4x1 mm) injected into the belly of newly spent fish during March–April. In recent years spent herring have been less available as they leave the coast immediately after spawning. Under these circumstances the wintering period during September–January, when the stock is gathering in fjords of northern Norway, seems more suitable for tagging purposes. However, the tradition of tagging spent herring is based on the hypothesis that maturing individuals have higher tagging mortality (scale loss, gonad damages) and shedding (tag loss during subsequent spawning). In the present paper this hypothesis is evaluated based on three tagging experiments on captive herring, starting in June 2000, October 2000, and January 2001. In each of the experiments herring were removed from a storage sea pen and divided into three experimental pens; one without treatment, another with traditional tags, and a third with comparatively smaller coded wire tags (1.1 x 0.25 mm) injected into muscle tissues of the neck, where tagging mortality or shedding should not be related to gonad damages or spawning activities. All three experiments were run over periods of three months and mortalities and shedding rates were recorded.

Keywords: herring, maturation, mortality, shedding spawning, tagging.

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