

TAGGING CONSIDERATIONS FOR ADULT AND JUVENILE PACIFIC LAMPREY

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ABSTRACT

Adult and, to a lesser extent, juvenile Pacific lampreys (*Entosphenus tridentatus*) are routinely implanted with radio transmitters, PIT tags, and other devices for a variety of reasons. However, little is known about the effects of implanting these devices in lampreys nor have standardized, effective protocols been developed for some procedures. Here, we present new information on the long-term impacts of surgically implanting radio tags into adult lampreys and the development of fast, safe, and effective techniques for PIT tagging juvenile lampreys. For our radio tag evaluation, we documented the rate of healing, tag loss, and survival of lampreys held in raceways with different substrate types (i.e., smooth, concrete, and cobble) and receiving Columbia River water over a period of about one year. After surgery, fish healed faster (21 d) in the cobble and concrete raceways compared to those in the smooth raceway (>60 d), although healing depended on when sutures were lost. Regardless of substrate, lampreys that lost their sutures in less than 14 d after surgery healed faster (21 d) than those that retained sutures longer (38 d). Although evidence of fungal and other infections was common, no tags were expelled during the study and many fish reached sexual maturity. For our PIT tag assessment, we subjected groups of fish (100-190 mm) to one of three treatments in the laboratory: (1) PIT tag insertion via an incision along the mid-ventral line; (2) PIT tag insertion via an incision lateral to the mid-ventral line; and (3) handling and anesthesia only (control fish). No sutures were used to close the incisions and we held fish for 32 d and monitored mortality and tag loss. After 32 d, cumulative mortality was 20% in the lateral incision group, and near 30% for the mid-ventral incision and control groups. Mortality began on day 3 for the mid-ventral incision group, day 5 for the control group, and on day 10 for the lateral incision group and was related to fish size, with most dead fish being less than 150 mm and having a mass less than 4 g. Most of the fish that died had fungal, parasitic, or bacterial infections. All incisions healed well, showed no signs of infection, and no tags were lost during the study. Our results indicate that it is possible to quickly and effectively mark juvenile lampreys with PIT tags. However, more work is needed to understand the impacts of handling and anesthesia on disease outbreaks, the pathogen-disease dynamics in young lampreys, and the long-term impacts of marking these fish with PIT tags, including their transfer to sea water. We hope our work will contribute to the development of a basin-wide PIT tagging program for lampreys in the future.