

SUCCESSFUL TRANSMITTER IMPLANTATION REQUIRES MORE THAN JUST A SAFE SURGERY: THE STORY OF THE WESTERN GREBE (*Aechmophorus occidentalis*)

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ABSTRACT

Western grebes (*Aechmophorus occidentalis*) are obligate aquatic birds that breed on freshwater inland lakes, constructing floating nests in emergent vegetation, and winter on marine waters. They are one of the marine bird species most often affected by oil spills in California and are believed to be in decline on the west coast of the United States. Early attempts to implant them with intracoelomic transmitters with percutaneous antennae using a standard surgical technique² resulted in 100% mortality. A captive study using 21 birds and a slightly modified surgical procedure resulted in minimal detectable homeostatic disturbance in implanted birds, suggesting hope for increasing postoperative survival of implanted birds released into the wild.¹ A subsequent study implanted and released 9 Western grebes using this modified technique.³ All but one bird survived at least 25 days arguing for an overall lack of surgery-related complications. The 44-56% mortality rate (or transmitter failure) within the first year after release, however, suggests that post-release complications such as impaired waterproofing, chronic low-grade infection, increased energy requirements due to transmitter weight, antenna drag or increased preening, increased predation, or, more likely, some degree of multifactorial interaction needs to be addressed before this procedure can be used with confidence. Although not well described or studied, an interactive effect likely exists between stress, thermoregulation, behavior, nutrition and immunity and this conspires against survival after capture, handling and transmitter implantation surgery. All of these factors should be addressed to maximize postoperative survival of implanted animals.

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