

Effects of Repeated Hoopnetting and Handling on Bonytail Chub

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ABSTRACT

We evaluated the effects of repeated hoopnet sampling and subsequent handling on the endangered bonytail chub (*Gila elegans*) to determine if these sampling techniques cause increased mortality or reduce fish growth. A total of 327 bonytail chub was tagged with passive integrated transponder (PIT) tags and placed in a 0.04 ha pond on July 2003. These fish were sampled with hoop nets during four, three-day sampling events, two in fall (September-October 2003) and two in spring (June 2004). Fish were measured and weighed with the time required to complete all steps for processing an individual fish being recorded. Individual fish were handled from one to eight times during the study, with >95% recaptured five or fewer times. Fish that were recaptured multiple times grew less in length ($P < 0.001$) and weight ($P < 0.001$) than fish that were not recaptured. Fish recaptured up to five times grew only 12.8% of their initial weight compared to fish not recaptured which grew 29.7% of their initial weight.

INTRODUCTION

Sampling and handling fish are critical in determining characteristics of fish populations, but sampling practices should try to minimize impacts on fish communities. This is particularly true for rare and endangered species (Rahel et al. 1999). Researchers generally assume that handled fish survive and behave normally after release (Kelsch and Shields 1996), but recently non-lethal capture methods such as electrofishing have been shown to cause injuries and even death (e.g., Sharber and Carothers 1988, Holliman et al. 2003). Hoop netting is also considered a non-lethal sampling technique (Hubert 1996) and little attention has been given to the effects of this gear type on fish.

Repeated handling (e.g., weighing, measuring, tagging) is necessary for many fish studies, particularly when mark-recapture experiments are used to estimate population size, fish growth, and movement (e.g., Douglas and Marsh 1996, Gorman and Stone 1999). Many studies have examined the stress response in fish (reviewed by Wedemeyer et al. 1990), and all aspects of sampling including capture, handling, confinement, and time out of water can cause reduced growth (Aboul Hosn et al. 2000), stress, and possibly mortality (Kelsch and Shields 1996, Stickney and Kohler 1990). However, physiological responses of fish to handling from sampling can vary with the type of gear and techniques used to capture fish (Kelsch and Shields 1996). The effects of stress can be cumulative (Wedemeyer et al. 1990), and even standard handling procedures such as

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