Scale aging of Central Valley steelhead reveals life history differences between stocks

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**Abstract**

Steelhead in California’s Central Valley exhibit a wide range of life histories, which can be observed through scale analysis. Growth patterns in steelhead scales can be used to estimate total age of the fish and the age and size of the fish at various developmental stages in its life, such as at smolt emigration, ocean entry, and maturity. The purpose of this study is to develop and report life-history information on four Central Valley steelhead populations. Scale samples were collected over multiple spawning seasons from adult hatchery- and natural-origin steelhead at the following Central Valley anadromous hatcheries: Coleman National Fish Hatchery on Battle Creek, Feather River Hatchery, Nimbus Hatchery on the American River, and Mokelumne River Hatchery. Results show that, on average, hatchery-origin steelhead enter the Pacific Ocean shortly after release, at which time the fish are about 1 year of age and average 200 mm in length. Anadromy among natural-origin steelhead is more variable. For example, American River steelhead exhibit a very high degree of anadromy, whereas natural-origin steelhead of the other stocks exhibit a much lower degree of anadromy. Based on age at time of sample collection, the dominant spawner cohort at Nimbus Hatchery is 3 years of age, whereas the dominant spawner cohort at the other Central Valley hatcheries is 2 years of age. There is also evidence of repeat spawners at all four of the hatcheries. The next step in this study is to collect various measurements of adult scales and perform back-calculations to help determine size of the fish at various life-history stages. Basic life history information, reflecting local adaption, is necessary to improve management of habitat, biodiversity, hatchery operations, and sport fisheries for Central Valley steelhead.