

Recurring impacts from non-persistent fish: perspectives on interactions between wild and artificially-produced salmonids

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Many studies have demonstrated competitive differences between hatchery- or farm-produced salmonids and their wild counterparts. Although outcomes change with rearing densities and environments, most studies indicate that salmonids of hatchery origin are more aggressive and vulnerable to predation, are less efficient at selecting profitable feeding areas, grow faster and develop different body morphologies than wild salmon and trout. Although in rare cases it might be possible to predict the short-term outcome of competitive interactions between hatchery and wild fish, the long-term ecological consequences of those encounters are far from being understood. This is in part due to the fact that the numbers of salmonids of hatchery or farm origin that may enter streams and coastal waters are decoupled -at least initially- from the environmental mechanisms that control the size of wild fish populations. Therefore, the number of invaders may remain temporarily high even during unfavourable periods. Short-term, albeit recurring, pulses of large numbers of artificially-produced fish may cause long-term negative impacts (e.g., increased competition, attraction of predators, disease transmission, etc.) on natural fish populations regardless of the apparently poorer performance of hatchery fish in the wild.

Because the long-term effects of hatchery and fish-farm operations could significantly reduce or even eliminate wild populations of salmonids and other fish species, safer management practices need to be implemented to minimize such threat. Systematic evidence reviews -like the metadata analyses commonly used in the medical field- combined with adequate predictive models may contribute both to the prioritization of research efforts and the development of risk-adverse management practices that minimize the environmental impacts of salmonid aquaculture.