

Genetically modified fish on the loose?

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Genetically modified fish that overexpress growth hormone have been created for more than 25 years, but unlike many domesticated crops, transgenic fish have yet to enter commercial production. Because of the difficulty inherent in eradicating an established fish population, efforts are under way to model the threat posed by possible invasions.

In an article for an upcoming issue of *BioScience*, a team of government and academic researchers, led by Robert Devlin of Fisheries and Oceans Canada, examined the possible outcomes of an accidental release of transgenic fish. Their research points to numerous difficulties in modeling the prospective fitness and invasion potential of released transgenic fish (<http://io.aibs.org/devlin>).

The genetically modified salmonids the authors studied possess a suite of traits that may, under different conditions and at different life stages, render them more or less fit than wild-type salmon. For instance, the authors report that [growth hormone](#)-transgenic salmon exhibit enhanced feeding motivation. This altered feeding behavior could help them outcompete wild-type fish for food. However, more aggressive feeding might expose the [transgenic fish](#) to greater predation risk, thereby reducing their net fitness. Unraveling the net consequences of such opposing effects poses a significant challenge for regulators and decisionmakers, the authors say.

Also troublesome for modeling is the wide range of possible invasion scenarios. Even though many transgenic lines are expected to have reduced fitness compared with wild-type conspecifics, they could

become established in alternative niches. As the authors put it, 'Many novel genotypes in the form of invasive species can successfully establish in new ecosystems even without having a specific evolutionary history in those locations.' Further complicating matters is the possibility of transgenic fishes' adapting to the local habitats and selection pressures of the ecosystems they invade.

To address these wide-ranging concerns, the authors suggest a modeling approach that relies on the assessment of transgenic and surrogate strains in a broad array of conditions designed to simulate natural ecosystems. However, they caution, whether such risk assessments will sufficiently reduce uncertainty and preserve ecosystems 'remains a significant objective for further research.'

Provided by American Institute of Biological Sciences

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