BOOK REVIEW

FRESHWATER MUSSEL PROPAGATION FOR RESTORATION

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Freshwater mussels are among the most imperiled invertebrates worldwide. North America is their diversity hot spot, but even there 74% of the known 300 species face conservation challenges: 220 are listed as endangered, threatened, or of special concern, and at least 35 are considered extinct. Dam, highway and bridge construction, pollution and sediment toxicity, wetland drainage and channelization, sedimentation and siltation resulting from poor agricultural and silvicultural practices, interbasin transfer schemes, and habitat loss through dredging and other land-use activities are the main causes of such a disconcerting decline. Threats such as pollution, sedimentation, and habitat loss are similar to those that marine invertebrates are increasingly facing, making this an eye-opening read for marine ecologists as well.

In such a context, propagation and stocking of freshwater mussels can be an effective tool to support declining populations. The idea is not new, with the first attempts to supplement declining populations dating back to more than a century ago to counteract overharvesting for the pearl button industry. In the 1960s, the interest rebounded for conservation objectives, after the widespread reports of dramatic population declines. Today, conservation actions are even more urgent. Freshwater mussels have a complex life history with long generation times and a parasitic larval stage. Natural recolonization of restored habitats can thus take decades, and propagation programs are often necessary to prevent extinction.

Any such kind of action requires a careful assessment of its impacts, and I am thus particularly pleased to read a long list of questions to consider before starting a freshwater mussel propagation program right in the first chapter. For example, is it truly the best restoration strategy? Have genetic concerns been addressed? And what about ecological consequences? Have local to federal regulations and permit requirements been identified? A thorough reasoning before acting is mandatory in this field. The practical aspects of this book underline the mismatch between thoughtlessly triggered species declines and the major efforts required to slow or reverse them—lessons that are valuable for marine ecologists in general and all those interested in conservation efforts.

The second chapter contains an amazing review of mussel biology, including some basic information on their systematics and a thorough review of larval biology. Indeed, the parasitic lifestyle of the larvae of most species requires identifying, acquiring, and also caring for the fish host in captivity; the third chapter is completely dedicated to this fundamental step. The following chapters focus increasingly on the practicalities of propagation such as brood stock collection, transportation and captive care, larval metamorphosis and juvenile mussel collection, juvenile mussel culture, release and monitoring, and even propagation facility building. Appendices follow with form templates, contact details of running propagation facilities, and further details on algal culture for mussel feeding. Twenty pages of references end this amazing work. It would be nice to start seeing such comprehensive treatments also for some marine species. The first attempts to reintroduce giant clams in the wild, for example, provided encouraging results. We may not be far from realistic plans to reintroduce these flagship species in depleted coral reefs on a large scale. The book has several figures. Most in black and white unfortunately, but some of them are printed a second time in a color insert.

In a time of biodiversity collapse, when even the United Nations have certified that a million species may go extinct in a few decades, the realistic perspective of restoring threatened populations gives some hope for a less dramatic future.

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