

## COMMENTARY

**Biocontrol in Hawaii: A Response to Messing (2007)**

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In recent decades, disagreement regarding the role of biocontrol in causing ecological damage versus its agricultural benefit has increased (e.g., Howarth 1985, 1991; Henneman and Memmott 2001). Because of the historical importance of biocontrol in its agriculture and the high recent extinction rates of its endemic wildlife, Hawaii has been termed the “crucible of the debate” (Messing and Wright 2006).

In a recent commentary, Messing (2007) depicted biocontrol in Hawaii in an unambiguously positive light, stating that “several recent studies have confirmed the excellent safety record of well-planned natural enemy introductions by trained entomologists.” In Messing’s view, however, “biocontrol practitioners still operate under the cloud of suspicion from mishaps of indiscriminate introductions...carried out by untrained individuals with no state supervision early in the last century” resulting in “severe bureaucratic obstacles to obtaining the necessary permits for field release of biocontrol agents.”

A number of biocontrol programs in Hawaii and the Pacific not only failed to control target pests, but have backfired spectacularly, leading directly to range reductions and extinctions of endemic taxa. A prime example is the repeated release of predatory invertebrates targeting the introduced giant African snail, *Achatina fulica*, starting with the release of numerous predatory snail and insect species in Hawaii between 1948 and 1963 (Davis and Butler 1964). Among these predators was *Euglandina rosea*, introduced first to Hawaii from its native southeastern United States in 1955 by the Board of Agriculture and subsequently by officials in French Polynesia, American Samoa and elsewhere (Mead 1979, Cowie 2001). *Euglandina rosea* has become a primary destructive agent of native Hawaiian and Pacific island snails (Christensen 1984; Cowie 2001). These programs were carried out not by “untrained individuals with no state supervision early in the last century” (Messing 2007), but in the latter half of the 20<sup>th</sup> century by trained entomologists employed by various government agencies in Hawaii and other Pacific islands (often following consultation with agencies in Hawaii); they continue in the 21<sup>st</sup> century with the introduction and official promotion of the flatworm *Platydemus manokwari*, an indiscriminate snail predator (Cowie and Robinson 2003).

Messing offered four recommendations to improve biocontrol practice in Hawaii. We concur with two of them (increased financial support for systematists, improved quarantine), and we agree that *unbiased* public education (including negative impacts of biocontrol) is

important. However, we have serious reservations about the implications of his statement that “we should streamline the permit bureaucracy, maintaining a strong level of biological review but minimizing the extent to which the regulatory framework lacks efficiency, rationality, transparency, accountability, and ecological meaning.” While his position may superficially appear to be reasonable, we believe the track record of biocontrol in Hawaii and elsewhere raises serious environmental concerns and indicates that the level of public scrutiny of decisions to release biocontrol agents into Hawaii’s fragile ecosystems should be increased, not diminished.

We agree with Messing (2007) that rigorous biological review is important, that minimizing inefficiency, irrationality, lack of transparency and lack of accountability in government are laudable goals, and that such decisions should be based on scientific data. However, we disagree that these processes should be expedited because “state, federal, and university entomologists recognize and appreciate that biocontrol is a largely safe and eminently cost effective method” (Messing 2007). On the contrary, the lack of evaluation and acknowledgement of potential ecological impacts is the very reason for the “slowdown in biocontrol projects” and the “demands for more stringent host-range testing.”

Messing (2007) expressed concern about over-regulation of biocontrol programs in Hawaii, without identifying specific features of the existing regulations. Earlier (Messing 1992), however, he had opposed Howarth’s (1985) recommendation that an environmental impact statement (EIS) should be a prerequisite to release of biocontrol agents in Hawaii. The recent recognition by the Hawaii Department of Agriculture (HDOA) that its biocontrol activities are subject to the public notice and comment requirements of Chapter 343, Hawaii Revised Statutes (Hawaii Environmental Policy Act, HEPA), is a correct interpretation of long-established law (Christensen et al., in prep.; see also a recent decision of the Hawaii Intermediate Court of Appeals, *Ohana Pale Ke Ao v. Board of Agriculture, State of Hawaii*, 118 Hawaii 247, 188 P.3d 761 [Hawaii Ct. App. 2008]) and is essential to a transparent process of informed decision-making, moving the law to a position close to that advocated by Howarth (1985, 1991). A more detailed interpretation of the law and an expanded commentary on this controversy is to be published elsewhere (Christensen et al., in prep.).

In the United States, biocontrol activities may be regulated at federal and/or state levels. At the federal level, however, “[o]versight derives from a hotchpotch of old legislation designed to serve agriculture, and protection of native species under the current regulatory framework is deficient” (Strong and Pemberton 2001, see also Simberloff 2005). Also, as Messing and Wright (2006) acknowledged, “[t]he US currently has no comprehensive regulatory framework for importing biological control agents.” It is all the more imperative, therefore, that the State of Hawaii undertake its own process of rigorous oversight of biocontrol activities within its jurisdiction.

The recent approval of the *Erythrina* gall wasp biocontrol project on the basis of acceptance of a final EA (environmental assessment), without the need for an EIS, demonstrates that HEPA will not impose an excessive burden, while substantially improving transparency and accountability. In contrast, HDOA’s proposal for the release of a scale insect for the control of strawberry guava (*Psidium cattleianum*) has generated considerable controversy (Anonymous 2008), based not on alleged impacts to non-target organisms, but on opposition to the destruction of the target itself by those who value its fruit. We support diminishing the adverse effects of strawberry guava on Hawaii’s native forests, but controversy over the desirability of eradicating an organism that has positive value is exactly the type of regulatory dispute that should be resolved only after open debate, allowing non-governmental interests to be heard. Accordingly, although compliance with Chapter 343 may involve delay in the initiation of the proposed action, the eventual decision will be better informed than if it were made without public input.

Messing and Wright (2006) stated that “[i]n successful biological control, the results can be dramatic,” and while we agree, we would add that in unsuccessful biological control, the results can be even more dramatic.

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