# Simulating Smarter Conservation: Adaptive Management for Endangered Hihi Birds

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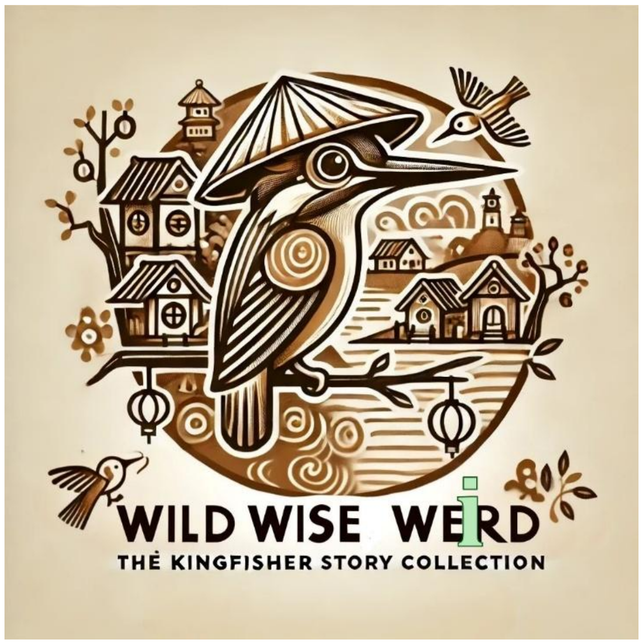


"Two titles of nobility given by Humans are not easy for anyone living on this Earth to obtain.

Any bird species that meets both of the above conditions will be listed as one facing a very high risk of complete extinction and should be included in the IUCN Red List."

In "Titles of Nobility"; *Wild Wise Weird* [1]

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Adaptive management (AM)—an approach that incorporates learning into decision-making—has long been recognized for its potential in conservation but remains underutilized due to the complexity of real-world ecological systems [2,3]. In a recent study, Canessa et al. [4] introduced a simulation-based approach to AM, integrating management strategy evaluation (MSE), a tool widely applied in fisheries, to inform recovery strategies for the endangered hihi (*Notiomystis cincta*), a forest bird endemic to Aotearoa-New Zealand.

The research team collaborated with the Hihi Recovery Group to develop and test seven adaptive strategies across 13 sites, each differing in risk tolerance and learning emphasis. Simulations combined demographic trends, monitoring efforts, and key management actions—such as translocations and supplementary feeding—over a 20-year horizon. Strategies were evaluated against five objectives: maximizing total bird numbers, increasing population distribution, reducing human intervention (enhancing "naturalness"), minimizing costs, and promoting public engagement through advocacy.

Findings revealed clear trade-offs. The most conservative strategy—providing food at all sites—produced the highest bird numbers and widest distribution but was the most costly and least natural. Conversely, learning-oriented strategies that reduced feeding or prioritized riskier site reintroductions were more cost-effective and natural but led to smaller populations and greater uncertainty. Despite an initial preference among stakeholders for these learning-focused approaches, the simulation results led most to favor safer, more predictable management strategies.

This study highlights the strengths of simulation-based AM: offering a transparent, deliberative process that bridges the gap between theoretical optimization and intuitive decision-making [5]. While the 20-year timeframe limited the potential benefits of long-term learning, the approach enabled conservationists to weigh multiple objectives and navigate uncertainty in a realistic setting.

Ultimately, the work underscores a core principle of conservation: sustaining biodiversity requires balancing ecological knowledge with ethical stewardship. Investing in adaptive strategies that are scientifically informed, financially viable, and socially acceptable is critical for securing the future of vulnerable species like the hihi—where nature and human responsibility converge [6,7].

**References**


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