# Optimally allocating resources for gathering evidence and managing biodiversity

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Conserving biodiversity means working with limited resources and incomplete information. In the face of uncertainty, practitioners can develop management plans using existing data or they can gather evidence to refine them. Since gathering evidence consumes limited resources, plans for gathering evidence must strategically maximize the amount of information gained to improve management decisions and also ensure that sufficient resources remain for implementing management actions. Here, we investigated different approaches for developing plans to gather evidence. We evaluated these approaches using value of information analyses and decision support tools to simulate management decisions based on different outcomes. We found that directly maximizing return on investment was by far the most effective approach for developing plans to gather evidence. Under limited budgets, alternative approaches produced plans that were highly ineffective. They allocated a large proportion of the available resources towards gathering evidence, so that few resources remained for actually achieving conservation objectives. It was only under relatively large budgets -- when a large amount of resources remained for achieving conservation objectives -- that alternative approaches had near-optimal performance. Our results show that plans for gathering evidence can be substantially improved by explicitly quantifying their capacity to improve conservation decisions. We recommend using value of information analyses, when feasible, to optimally balance the allocation of resources for gathering evidence and conserving biodiversity.