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Decision-Support Tools for Pest Control

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One of our greatest challenges is increasing agricultural yields while reversing degradation of biodiversity and Earth's life-support systems. A promising approach that has not yet reached its potential involves managing land to enhance the flow of ecosystem services from natural habitats around farms. In particular, conserving natural habitat to support predators of crop pests is an unrealized win-win for biodiversity and farmers, as arthropod pests destroy 8–15% of major food crops. We seek to develop the scientific foundation for incorporating pest control into resource decisions through building a compelling evidence base, packaging science into practical tools for decision-makers, and demonstrating their efficacy using field data. Specifically, we will compile a global, spatially-referenced dataset documenting pest colonization and suppression on socially and economically important crops. This dataset will be used to build simple, statistical models relating changes in landscape composition to pest abundance indices, crop damage, and economic loss. Models will be tested against field data provided by our group members, and integrated into an open-access, ecosystem-service modeling platform (InVEST) developed by the Natural Capital Project. Such spatial models do not yet exist for pest control, but have been developed for other services to guide major natural resource decisions. For example, InVEST is being used to implement a new reserve system spanning >25% of China to secure natural capital and human wellbeing. The Natural Capital Project is working in over 20 countries and would use our tools in important policy decisions in the short term.

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Links
[1] https://www.sesync.org/ventures
[2] https://collab.sesync.org/groups/pest-control-tools
[3] mailto:pest-control-tools@lists.sesync.org