种群生存力分析（PVA）的方法与应用

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Methods and applications of population viability analysis (PVA): A review.

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摘要

随着人们对资源的加速利用，生境丧失和破碎化导致物种濒危问题日益严重.以岛屿生物地理学为理论起源的种群生存力分析（PVA），通过分析和模拟种群动态过程并建立灭绝概率与种群数量之间的关系，为濒危物种保护提供了重要的理论依据和研究途径.在过去的几十年中，种群生存力分析已成为保护生物学中一项重要的研究内容.目前种群生存力分析发展稳定，但对其实际预测能力和准确性尚存质疑，应用方面也有待进一步发展.种群生存力分析的进一步完善还需要在理论和方法上的创新，特别是籍于景观生态学和可持续性科学的理念，将空间分析手段、经济社会因素纳入到物种和种群的预测和管理上，从而使其具有更完整的理论基础和更高的实用价值.为此，本文对种群生存力分析的历史、基本概念、研究方法、模型应用和准确性进行了综述，并提出了有关的研究展望.

关键词：种群生存力分析　最小可存活种群　灭绝风险　种群动态

Abstract：

With the accelerating human consumption of natural resources, the problems associated with endangered species caused by habitat loss and fragmentation have become greater and more urgent than ever. Conceptually associated with the theories of island biogeography, population viability analysis (PVA) has been one of the most important approaches in studying and protecting endangered species, and this methodology has occupied a central place in conservation biology and ecology in the past several decades. PVA has been widely used and proven effective in many cases, but its predictive ability and accuracy are still in question. Also, its application needs expand. To overcome some of the problems, we believe that PVA needs to incorporate some principles and methods from other fields, particularly landscape ecology and sustainability science. Integrating landscape pattern and socioeconomic factors into PVA will make the approach theoretically more comprehensive and practically more useful. Here, we reviewed the history, basic conception, research methods, and modeling applications and their accuracies of PVA, and proposed the perspective in this field.

Key words：　population viability analysis　minimum viable population　extinction risk　population dynamics

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