Short communication

Conservation Genetic Resources for Effective Species Survival (ConGRESS): Bridging the divide between conservation research and practice

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ARTICLE INFO

ABSTRACT

Policy makers and managers are increasingly called upon to assess the state of biodiversity, and make decisions regarding potential interventions. Genetic tools are well-recognised in the research community as a powerful approach to evaluate species and population status, reveal ecological and demographic processes, and inform nature conservation decisions. The wealth of genetic data and power of genetic methods are rapidly growing, but the consideration of genetic information and concerns in policy and management is limited by the currently low capacity of decision-makers to access and apply genetic resources. Here we describe a freely available, user-friendly online resource for decision-makers at local and national levels (http://congressgenetics.eu), which increases access to current knowledge, facilitates implementation of studies and interpretation of available data, and fosters collaboration between researchers and practitioners. This resource was created in partnership with conservation practitioners across the European Union, and includes a spectrum of taxa, ecosystems and conservation issues. Our goals here are to (1) introduce the rationale and context, (2) describe the specific tools (knowledge summaries, publications database, decision making tool, project planning tool, forum, community directory), and the challenges they help solve, and (3) summarise lessons learned. This article provides an outlook and model for similar efforts to build policy and management capacity.

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Introduction

The potential applications of genetic data and tools, and the importance of genetic concerns, in conservation policy and practice are numerous and growing (Frankham 2010). Genetic data and powerful computational analyses are now routinely used to reveal demographic processes, identify gene flow and barriers, assist

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prioritisation of population protection, detect hybrids, and more. The increasing maturity of conservation genetics as a research discipline, with hundreds of peer-reviewed articles in the field each year (Vernesi, Bruford, & Bertorelle 2008), does beg the question: how do we ensure that the wealth of knowledge produced by researchers is actually applied to practice and policy? This question is familiar in conservation biology generally (Githiru, Lens, Adriaensen, Mwang'ombe, & Matthysen 2011; Knight, Cowling, & Rouget 2008), but is particularly thorny for conservation genetics- the available laboratory and computational tools are diverse and rapidly evolving, the gap between recommendations derived from assumption-laden models and on-the-ground constraints is substantial, and the concepts and research results are often ensconced in jargon and academic debates. The impression can be that conservation genetics is locked in an ivory tower rather than being shared and discussed by a community oriented towards action.

Indeed, the relative scarcity of genetics considerations in nature conservation policy at the global and European Union (EU) levels (Laikre 2010) despite clear opportunities for such consideration (Hoban, Hauffe, & Perez-Espona 2013; Santamaria & Mèndez 2012), suggests that the scientific knowledge base is largely untapped by conservation practitioners and decision-makers, regardless of recurring reviews of topics and techniques in the academic literature (Allendorf, Hohenlohe, & Luikart 2010; DeSalle & Amato 2004). If the goal of conservation genetics research is to contribute to monitoring and evaluating genetic biodiversity, and developing policy regarding genetic resources (and thus, also conserving the species and ecosystems that depend on sufficient genetic diversity), the generation and publication of genetic data and theories are insufficient. Improved synthesis, clarification, and dissemination of knowledge is necessary (Osmond, Nadkarni, & Driscoll, 2010). Simultaneously, the capacity of managers and policy-makers to absorb and use key information must be enhanced through education, training, and practical tools. In addition, academics need to be further empowered to conduct genetic research directed

at specific conservation problems (Laurance, Koster, & Grooten 2012). On December 1st 2012, the ConGRESS project launched a web-portal (http://www.congressgenetics.eu/) to tackle these challenges by collating research results, summarising foundational knowledge (e.g. for what applied questions can genetics be used, how can relevant genetic information be obtained), explaining best practice, facilitating the planning of genetic studies and interpretation of results, and establishing networking and collaboration opportunities. ConGRESS (Fig. 1), which may be a useful model for capacity-building, features six sections (plus news/event announcements). Notably, there are diverse entry points allowing access by users with different background knowledge, goals (e.g. policy, learning, research), and time commitments (e.g. practitioners/managers, decision-makers, technicians, researchers).

How do the elements of ConGRESS address specific challenges?

The importance of communicating scientific outcomes to managers and policy makers is widely recognised but generally unsuccessful, partly because conservation researchers rarely utilise accessible, concise language (Laurance et al. 2012). Ensuring basic familiarity with central topics can provide a common vocabulary for discussion, and guard against misunderstandings or misinterpretation (Osmond et al. 2010). The first output of ConGRESS is a "Knowledge Pack," comprising a series of downloadable information sheets explaining genetic concepts and issues in non-technical language, designed for uptake by policy-makers and managers with little or no genetics background. These short, engaging documents also summarise best practice for genetic-based interventions, including the use of new laboratory and analytical techniques, and types of genetic data. In addition, there is a one-hour annotated slideshow presentation explaining how conservation genetics is relevant to management, with recent case studies (e.g. Bourke, Frantz, & Lavers, 2010; Vähä, Erkinaro, Niemelä, & Primmer, 2007)
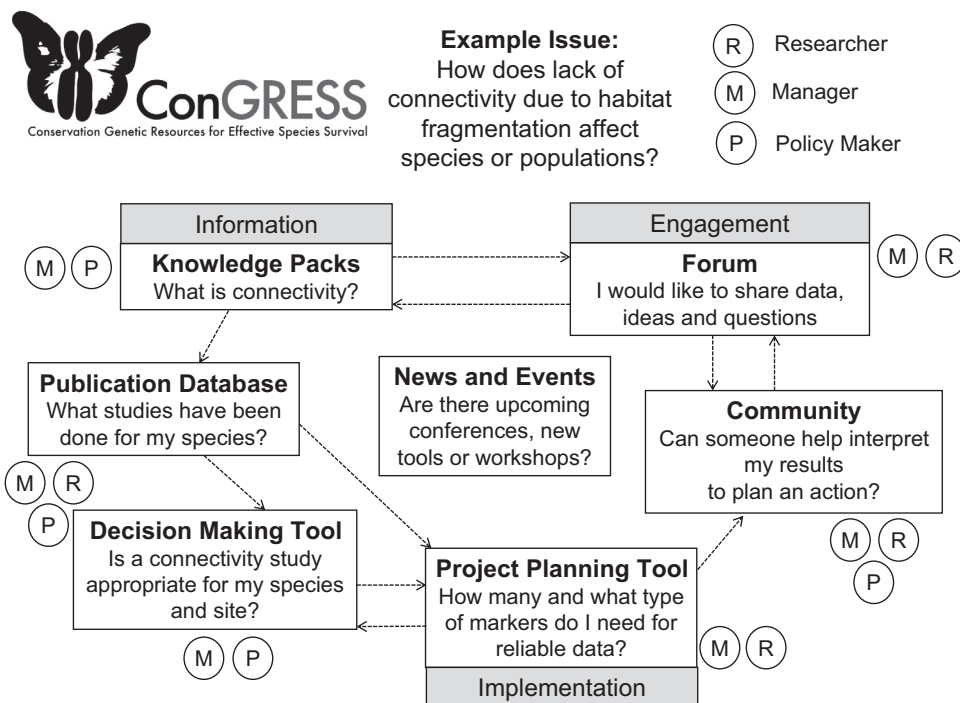

Fig. 1. Schematic diagram of ConGRESS web resource, showing potential entry points for simplified user groups (circles). Arrows show potential workflow between sections, but other connections are possible. Within each section is an example query (non-bold type). The issue "connectivity" is used as an example, but is only one of various problems considered in ConGRESS.