

O'Connor, C. D., G. M. Garfin, et al. (2011). "**Human Pyrogeography: A New Synergy of Fire, Climate and People is Reshaping Ecosystems across the Globe.**" *Geography Compass* 5(6): 329-350.

Climate and fire have shaped global ecosystems for millennia. Today human influence on both of these components is causing changes to ecosystems at a scale and pace not previously seen. This article reviews trends in pyrogeography research, through the lens of interactions between fire, climate and society. We synthesize research on the occurrence and extent of wildland fire, the historic role of climate as a driver of fire regimes, the increasing role of humans in shaping ecosystems and accelerating fire ignitions, and projections of future interactions among these factors. We emphasize an ongoing evolution in the roles that humans play in mediating fire occurrence, behavior and feedbacks to the climate system. We outline the necessary elements for the development of a mechanistic model of human, fire and climate interactions, and discuss the role geographers can play in the development of sound theoretical underpinnings for a new paradigm of human pyrogeography. Disciplines such as geography that encourage science-society research can contribute significantly to policy discussions and the development of frameworks for adapting fire management for the preservation of societal and natural system priorities.

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Eiswerth, M. E., S. T. Yen, et al. (2011). "**Factors determining awareness and knowledge of aquatic invasive species.**" *Ecological Economics* 70(9): 1672-1679.

Public perceptions of invasive species may influence policies and programs initiated by public and private stakeholders. We investigate the determinants of the public's awareness and knowledge of invasive species as few studies have examined this relationship. We focus on aquatic invasive species (AIS) and employ survey data from property owners in a lake district. A major contribution is that we estimate a mixed trivariate binary-ordered probit regression model that accommodates correlations among unobserved characteristics, produces statistically more efficient estimates, and allows a more proper investigation of the probability of knowledge conditional on awareness. Our results provide insights for invasive species education and management programs. We find that individuals are more likely to be aware of AIS if they participate in water-based recreation, visit lakes outside their area, have a boat, belong to a lake association, or are college educated. This has a policy implication: Given high levels of AIS awareness by those most involved in activities around lakes and those with a higher education, it may be beneficial to target informational campaigns at those who do not display these characteristics, so that they can better make informed decisions about whether to support and expend money on invasive species management programs.

FULL TEXT LINK: <http://www.sciencedirect.com/science/article/pii/S0921800911001650>

Thompson, J. R., T. A. Spies, et al. (2011). "**Canopy damage to conifer plantations within a large mixed-severity wildfire varies with stand age.**" *Forest Ecology and Management* 262(3): 355-360.

The 2002 Biscuit Fire burned at mixed-severities encompassing over 200,000 ha of publicly owned forestland, including more than 8300 ha of conifer plantations. We used pre- and post-fire digital aerial photography to examine how the level of canopy damage varied within these plantations in relation to topography, weather, vegetation-cover, and management history, with an emphasis on the age of the plantation. We examined 198 plantations that varied widely in age (5-47 years), size (1.25-47 ha), and landscape context. The average level of canopy damage within the plantations was 77%. Based on Random Forest variable importance values, plantation age was the best predictor of canopy damage. Average annual precipitation, elevation and topographic position were ranked second, third, and fourth, respectively. A model selection procedure, using geo-statistical regression models and Akaike's information criterion, corroborated the importance of plantation age relative to the other predictors tested and also suggested that the influence of age varied over time. The top ranked regression model indicated that the level of canopy damage reached its maximum around age 15 and stayed relatively high until age 25 before declining.

FULL TEXT LINK: <http://www.sciencedirect.com/science/article/pii/S0378112711002143>

Remm, J. and A. Lõhmus (2011). "**Tree cavities in forests - The broad distribution pattern of a keystone structure for biodiversity.**" *Forest Ecology and Management* 262(4): 579-585.

We explored the main factors affecting the global distribution of tree cavities - a habitat component of mostly biotic origin that is crucial for many animal species. We considered the influence of eight environmental variables (ranging from the single-tree to the biogeographic-region scale) on cavity density in a meta-analysis of 103 published studies. The global median density of cavities was 16 ha⁻¹, with densities highest in Australasia and lowest in the Palearctic region. Two major factors influencing density were identified: cavity density was positively related to the amount of precipitation, and was higher in natural than in managed forests. These effects suggest that the distribution of tree cavities largely reflects the incidence of fungal heart-rot in trees, and that forest management, by affecting wood decay processes, can have a broad-scale impact on tree microhabitat availability. Although air temperature, forest composition and wood hardness had suggestive univariate effects, neither these variables nor biogeographic region explained any additional variation in multifactor models. In regions where woodpeckers are present there was an upper limit to the density of woodpecker-excavated cavities (approximately 10-20 cavities ha⁻¹) that was considerably lower than the highest total cavity densities encountered (up to 140 ha⁻¹). This indicates that primary cavity-nesters are particularly important keystone species in cavity-poor forests where wood decay processes are suppressed either climatically or by forest management.

FULL TEXT LINK: <http://www.sciencedirect.com/science/article/pii/S037811271100243X>

Cerveney, L. K., D. J. Blahna, et al. (2011). "**Forest Service Interdisciplinary Teams: Size, Composition, and Leader Characteristics.**" *Journal of Forestry* 109(4): 201-207.

Interdisciplinary (ID) teams were created by the US Forest Service in response to environmental legislation. In 2008, we surveyed ID team leaders for National Environmental Policy Act (NEPA) analysis of 106 recreation-related projects conducted between 2005 and 2008. Results were compared with current workforce data and previous studies of ID team leadership and composition for NEPA assessments. ID teams were large in size and diverse in composition, with representatives of a broad range of disciplines and functional areas. The composition of ID teams may be changing from traditional natural resource management to more discipline-specific expertise. The role of social scientists and other human dimension specialists remains modest, despite the importance of social science questions inherent in recreation projects. Results reflect changes in agency hiring practices in the last 20 years and raise questions about the interdisciplinary nature of US Forest Service ID teams.

FULL TEXT LINK:

<http://www.ingentaconnect.com/content/saf/jof/2011/00000109/00000004/art00005>

Becker, D. R., S. M. McCaffrey, et al. (2011). "**Conventional Wisdoms of Woody Biomass Utilization on Federal Public Lands.**" *Journal of Forestry* 109(4): 208-218.

The appeal of biomass utilization grows as the need for wildfire risk reduction, economic development, and renewable energy generation becomes more pressing. However, uncertainty exists regarding the factors necessary to stimulate use. We draw on in-depth interviews with local industry, agency, community, and tribal representatives from 10 study sites on federal public lands across the United States to examine persistent conventional wisdoms about what hinders biomass use. Findings indicate that the conventional wisdoms were reasonably accurate although the degree to which each impeded progress varied. Their interconnectedness also varied depending on local conditions. Supply guarantees, industry presence, transportation, and the value of the biomass were limiting factors to use, whereas agency budgets and staffing, environmental concerns, and partnerships more aggravated the problem than impeded progress. Understanding the scope and consistency of these accepted truths is important for ensuring that management efforts and ensuing policy effectively targets local use challenges.

FULL TEXT LINK: <http://www.ingentaconnect.com/content/saf/jof/2011/00000109/00000004/art00006>

Freeman, J. W., M. J. Stern, et al. (2011). "**Interdisciplinary collaboration within project-level NEPA teams in the US Forest Service.**" *Journal of Environmental Planning and Management* 54(5): 597 - 615.

Interdisciplinary teamwork has become a foundation of natural resources planning and management in the US. Yet, we know little about the degree of interdisciplinary collaboration of natural resource planning teams. We conducted 10 case studies of Forest Service NEPA (National Environmental Policy Act) teams working on projects related to the 2005 Travel Management Rule. Although teams' critical tasks were similar, we found wide variation in interdisciplinary teamwork approaches. We propose three typologies of teamwork processes and discuss relationships between teams' work approaches and process outcomes. Rather than being easily labeled as holistically 'collaborative' or 'non-collaborative', teams may more typically move in and out of different modes of collaboration (or non-collaboration) throughout the different stages of teamwork processes. Results suggest that greater external pressure may lead teams to adopt a more internally collaborative approach and that empowering leadership styles may enhance the success of more collaborative approaches in terms of perceived outcomes. Future research on the relationships between extra-team context, team collaboration, and leadership styles may provide insight into the drivers of outcomes in natural resource planning teams.

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Merritt, D. J. and K. W. Dixon (2011). "**Restoration Seed Banks—A Matter of Scale.**" *Science* 332(6028): 424-425.

With nearly two-thirds of the world's ecosystems degraded, the October 2010 meeting of the Conference of the Parties to the Convention on Biological Diversity (COP-10) highlighted ecological restoration as a significant opportunity for achieving global conservation goals. The restoration of nature, natural assets, and biodiversity is now a global business worth at least \$1.6 trillion annually and likely to grow substantially. Although seed banks have emerged as a tool to protect wild plant species, off-site (ex situ) conservation measures at seed banks must be complementary to "on the ground" management at the conservation site. For example, whereas global targets are for restoration or management of at least 15% of each ecological region or vegetation type, recognition of the mechanisms required to achieve these goals is largely absent from policies.

FULL TEXT LINK: <http://www.sciencemag.org/content/332/6028/424.short>

Glenn, E. M., R. G. Anthony, et al. (2011). "**Local Weather, Regional Climate, and Annual Survival of the Northern Spotted Owl.**" *The Condor* 113(1): 159-176.

We used an information-theoretical approach and Cormack—Jolly—Seber models for open populations in program MARK to examine relationships between survival rates of Northern Spotted Owls and a variety of local weather variables and long-term climate variables. In four of the six populations examined, survival was positively associated with wetter than normal conditions during the growing season or high summer temperatures. At the three study areas located at the highest elevations, survival was positively associated with winter temperature but also had a negative or quadratic relation with the number of storms and winter precipitation. A meta-analysis of all six areas combined indicated that annual survival was most strongly associated with phase shifts in the Southern Oscillation and Pacific Decadal Oscillation, which reflect large-scale temperature and precipitation patterns in this region. Climate accounted for a variable amount (1–41%) of the total process variation in annual survival but for more year-to-year variation (3–66%) than did spatial variation among owl territories (0–7%). Negative associations between survival and cold, wet winters and nesting seasons were similar to those found in other studies of the Spotted Owl. The relationships between survival and growing-season precipitation and regional climate patterns, however, had not been reported for this species previously. Climate-change models for the first half of the 21st century predict warmer, wetter winters and hotter, drier summers for the Pacific Northwest. Our results indicate that these conditions could decrease Spotted Owl survival in some areas.

FULL TEXT LINK: <http://www.bioone.org/doi/abs/10.1525/cond.2011.100118>

Lankau, R., P. S. Jørgensen, et al. (2011). "**Incorporating evolutionary principles into environmental management and policy.**" *Evolutionary Applications* 4(2): 315-325.

As policymakers and managers work to mitigate the effects of rapid anthropogenic environmental changes, they need to consider organisms' responses. In light of recent evidence that evolution can be quite rapid, this now includes evolutionary responses. Evolutionary principles have a long history in conservation biology, and the necessary next step for the field is to consider ways in which conservation policy makers and managers can proactively manipulate evolutionary processes to achieve their goals. In this review, we aim to illustrate the potential conservation benefits of an increased understanding of evolutionary history and prescriptive manipulation of three basic evolutionary factors: selection, variation, and gene flow. For each, we review and propose ways that policy makers and managers can use evolutionary thinking to preserve threatened species, combat pest species, or reduce undesirable evolutionary changes. Such evolution-based management has potential to be a highly efficient and consistent way to create greater ecological resilience to widespread, rapid, and multifaceted environmental change.

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