A cascade of warming impacts brings bluefin tuna to Greenland waters

Type	Journal Article
Author	Brian R. MacKenzie
Author	Mark R. Payne
Author	Jesper Boje
Author	Jacob L. Hoyer
Author	Helle Siegstad
Abstract	Rising ocean temperatures are causing marine fish species to shift spatial distributions and ranges, and are altering predator-prey dynamics in food webs. Most documented cases of species shifts so far involve relatively small species at lower trophic levels, and consider individual species in ecological isolation from others. Here, we show that a large highly migratory top predator fish species has entered a high latitude subpolar area beyond its usual range. Bluefin tuna, Thunnus thynnus Linnaeus 1758, were captured in waters east of Greenland (65 degrees N) in August 2012 during exploratory fishing for Atlantic mackerel, Scomber scombrus Linnaeus 1758. The bluefin tuna were captured in a single net-haul in 9-11 degrees C water together with 6 tonnes of mackerel, which is a preferred prey species and itself a new immigrant to the area. Regional temperatures in August 2012 were historically high and contributed to a warming trend since 1985, when temperatures began to rise. The presence of bluefin tuna in this region is likely due to a combination of warm temperatures that are physiologically more tolerable and immigration of an important prey species to the region. We conclude that a cascade of climate change impacts is restructuring the food web in east Greenland waters.
Date	AUG 2014
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:12
Extra	Place: Hoboken Publisher: Wiley WOS:000339100200012
Volume	20
Pages	2484-2491
Publication	Global Change Biology
DOI	10.1111/gcb.12597
Issue	8
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

atlantic, bluefin tuna, climate, fish, fisheries, food web, Greenland, mackerel, ocean, plankton, population-structure, predator-prey, sea, shifts, temperature, thunnus-thynnus, trophic cascade

Attachments

- Full Text

A meta-analysis reveals edge effects within marine protected areas

Type	Journal Article
Author	Sarah Ohayon
Author	Itai Granot
Author	Jonathan Belmaker
Abstract	A finding of smaller numbers of fish and invertebrates close within the border of a marine protected area compared to further inside may have profound effects on current estimates of population sizes in small- to medium-sized MPAs. Marine protected areas (MPAs) play a leading role in conserving and restoring marine environments. MPAs can benefit both marine populations within their boundaries and external populations owing to a net export of organisms (spillover). However, little is known about variation in performance within MPAs. For example, edge effects may degrade populations within MPAs close to their boundaries. Here we synthesize empirical estimates of 72 taxa of fish and invertebrates to explore spatial patterns across the borders of 27 no-take MPAs. We show that there is a prominent and consistent edge effect that extends approximately 1 km within the MPA, in which population sizes on the border are 60% smaller than those in the core area. Our analysis of cross-boundary population trends suggests that, globally, the smallest 64% of no-take MPAs (those of less than 10 km(2) in area) may hold only about half (45-56%) of the population size that is implied by their area. MPAs with buffer zones did not display edge effects, suggesting that extending no-take areas beyond the target habitats and managing fishing activities around MPA borders are critical for boosting MPA performance.
Date	SEP 2021
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:26:51
Extra	Place: Berlin Publisher: Nature Portfolio WOS:000669775300001
Volume	5
Pages	1301-+
Publication	Nature Ecology & Evolution
DOI	10.1038/s41559-021-01502-3
Issue	9
Journal Abbr	Nat. Ecol. Evol.
ISSN	2397-334X
Date Added	15/03/2023, 14:27:14
Modified	15/03/2023, 14:27:14

Tags:

abundance, adjacent, conservation, fisheries, fishing effort, patterns, reserves, spillover

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A window to the world of global insect declines: Moth biodiversity trends are complex and heterogeneous

Type	Journal Article

Author David L. Wagner
Author Richard Fox
Author Danielle M. Salcido
Author Lee A. Dyer

Abstract Moths are the most taxonomically and ecologically diverse insect taxon for which there exist considerable time-series abundance data. There is an alarming record of decreases in moth abundance and diversity from across Europe, with rates varying markedly among and within regions. Recent reports from Costa Rica reveal steep cross-lineage declines of caterpillars, while other sites (Ecuador and Arizona, reported here) show no or only modest long-term decreases over the past two decades. Rates of decline for dietary and ecological specialists are steeper than those for ecologically generalized taxa. Additional traits commonly associated with elevated risks include large wingspans, small geographic ranges, low dispersal ability, and univoltinism; taxa associated with grasslands, aridlands, and nutrient-poor habitats also appear to be at higher risk. In temperate areas, many moth taxa limited historically by abiotic factors are increasing in abundance and range. We regard the most important continental-scale stressors to include reductions in habitat quality and quantity resulting from land-use change and climate change and, to a lesser extent, atmospheric nitrification and introduced species. Site-specific stressors include pesticide use and light pollution. Our assessment of global macrolepidopteran population trends includes numerous cases of both region-wide and local losses and studies that report no declines. Spatial variation of reported losses suggests that multiple stressors are in play. With the exception of recent reports from Costa Rica, the most severe examples of moth declines are from Northern Hemisphere regions of high human-population density and intensive agriculture.

Date JAN 12 2021
Language English
Short Title A window to the world of global insect declines
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:07
Extra Place: Washington Publisher: Natl Acad Sciences WOS:000607277100009
Volume 118
Pages e2002549117
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.2002549117
Issue 2
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
Date Added 15/03/2023, 14:27:14
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Tags:

british moths, butterflies, climate-change, communities, conservation, ecological traits, extinction, grasslands, insect decline, insectivores, lepidoptera, Lepidoptera, management, parasitoids

Attachments

- Full Text

Acid rain recovery may help to mitigate the impacts of climate change on thermally sensitive fish in lakes across eastern North America

Type	Journal Article
Author	Dana R. Warren
Author	Clifford E. Kraft
Author	Daniel C. Josephson
Author	Charles T. Driscoll
Abstract	From the 1970s to 1990s, more stringent air quality regulations were implemented across North America and Europe to reduce chemical emissions that contribute to acid rain. Surface water pH slowly increased during the following decades, but biological recovery lagged behind chemical recovery. Fortunately, this situation is changing. In the past few years, northeastern US fish populations have begun to recover in lakes that were historically incapable of sustaining wild fish due to acidic conditions. As lake ecosystems across the eastern United States recover from acid deposition, the stress to the most susceptible populations of native coldwater fish appears to be shifting from acidification effects to thermal impacts associated with changing climate. Extreme summer temperature events - which are expected to occur with increasing frequency in the coming century - can stress and ultimately kill native coldwater fish in lakes where thermal stratification is absent or highly limited. Based on data from northeastern North America, we argue that recovery from acid deposition has the potential to improve the resilience of coldwater fish populations in some lakes to impacts of climate change. This will occur as the amount of dissolved organic carbon (DOC) in the water increases with increasing lake pH. Increased DOC will reduce water clarity and lead to shallower and more persistent lake thermoclines that can provide larger areas of coldwater thermal refuge habitat. Recovery from acidification will not eliminate the threat of climate change to coldwater fish, but secondary effects of acid recovery may improve the resistance of coldwater fish populations in lakes to the effects of elevated summer temperatures in historically acidified ecosystems. This analysis highlights the importance of considering the legacy of past ecosystem impacts and how recovery or persistence of those effects may interact with climate change impacts on biota in the coming decades.
Date	JUN 2017
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:50:49
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Volume	23
Pages	2149-2153
Publication	Global Change Biology
DOI	10.1111/gcb.13568
Issue	6
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
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Tags:

acid deposition, acid rain, acid rain recovery, adirondack region, brook trout, chemistry, climate change, coldwater fish, deposition, episodic acidification, lake stratification, new-york, northeastern united-states, Salvelinus fontinalis, small streams, temperatures, temporal trends, thermocline, water clarity

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Adaptation of reproductive phenology to climate change with ecological feedback via dominance hierarchies

Type Journal Article

Author Jacob Johansson
Author Henrik G. Smith
Author Niclas Jonzen

Abstract Phenological shifts belong to the most commonly observed biological responses to recent climate change. It is, however, often unclear how these shifts are linked to demography and competitive interactions. We develop an eco-evolutionary model to study adaptation of timing of reproduction in organisms with social dominance hierarchies. We focus on residential birds with winter flocks, where success in competition for territories among offspring depends on ranking given by prior residence. We study the effects of environmental change on breeding population densities, ensuing selection pressures and long-term evolutionary equilibria. We consider changes in food peak date, in winter survival, in total reproductive output and in the width of the food distribution. We show that the evolutionarily stable hatching date will advance with increasing winter survival and reproductive output since these parameters increase habitat saturation and post-fledging competition. Increasing the length of the breeding season also selects for earlier hatching date due to the reduced costs for producing offspring with high ranking. Our analysis shows that there is little correlation between short-term and long-term population responses across different scenarios of environmental change. However, short-term population growth consistently predicts selection for earlier reproduction. Hence, the model identifies changed breeding population density as a key factor to understanding phenological adaptation in systems with prior residence advantages. While selection for change in reproductive phenology is often explained by changed seasonal variation in environmental variables, such as food abundance, we show that environmental change without apparent effects on seasonality can critically affect phenological adaptation. Such factors can mask or even override influences of changed seasonality on phenology. The model thus offers a conceptually new set of explanations for understanding phenological and demographic trends in a changing climate.

Date MAR 2014
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:15
Extra Place: Hoboken Publisher: Wiley WOS:000331469200013
Volume 83
Pages 440-449
Publication Journal of Animal Ecology
DOI 10.1111/1365-2656.12151

Issue 2
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

blue tit, breeding phenology, evolutionary game theory, game-theory, great tit, juvenile marsh tits, life history, parus-major, population decline, prior residence, social-dominance, territory acquisition, territory competition, timing of reproduction, winter survival

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Adult male birds advance spring migratory phenology faster than females and juveniles across North America

Type Journal Article
Author Montague H. C. Neate-Clegg
Author Morgan W. Tingley
Abstract Advances in spring migratory phenology comprise some of the most well-documented evidence for the impacts of climate change on birds. Nevertheless, surprisingly little research has investigated whether birds are shifting their migratory phenology equally across sex and age classes-a question critical to understanding the potential for trophic mismatch. We used 60 years of bird banding data across North America-comprising over 4 million captures in total-to investigate both spring and fall migratory phenology for a total of 98 bird species across sex and age classes, with the exact numbers of species for each analysis depending on season-specific data availability. Consistent with protandry, in spring (n = 89 species), adult males were the first to arrive and immature females were the last to arrive. In fall (n = 98), there was little difference between sexes, but adults tended to depart earlier than juveniles. Over 60 years, adult males advanced their phenology the fastest (-0.84 days per decade, 95 CrI = -1.22 to -0.47, n = 36), while adult and immature females advanced at a slower pace, causing the gap in male and female arrival times to widen over time. In the fall, there was no overall trend in phenology by age or sex (n = 57), driven in part by high interspecific variation related to breeding and molt strategies. Our results indicate consistent and predictable age- and sex-based differences in the rates at which species' springtime phenology is shifting. The growing gap between male and female migratory arrival indicates sex-based plasticity in adaptation to climate change that has strong potential to negatively impact current and future population trends.
Date JAN 2023
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:50:51
Extra Place: Hoboken Publisher: Wiley WOS:000875832900001
Volume 29
Pages 341-354
Publication Global Change Biology
DOI 10.1111/gcb.16492

Issue 2
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:51:19
Modified 15/03/2023, 14:51:19

Tags:

age, arrival, arrival date, autumn migration, breeding latitude, climate change, climate-change, fall migration, long-distance migrants, molt strategy, protandrous migration, protandry, redstarts, sex, sexual-dimorphism, temperature sensitivity

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Advancing breeding phenology in response to environmental change in a wild red deer population

Type Journal Article
Author Kelly Moyes
Author Daniel H. Nussey
Author Michelle N. Clements
Author Fiona E. Guinness
Author Alison Morris
Author Sean Morris
Author Josephine M. Pemberton
Author Loeske E. B. Kruuk
Author Tim H. Clutton-Brock
Abstract Most evidence for advances in phenology of in response to recent climate warming in wild vertebrate populations has come from long-term studies of birds. Few studies have either documented phenological advances or tested their climatic causes and demographic consequences in wild mammal systems. Using a long-term study of red deer on the Isle of Rum, Scotland, we present evidence of significant temporal trends in six phenological traits: oestrus date and parturition date in females, and antler cast date, antler clean date, rut start date and rut end date in males. These traits advanced by between 5 and 12 days across a 28-year study period. Local climate measures associated with plant growth in spring and summer (growing degree days) increased significantly over time and explained a significant amount of variation in all six phenological traits, largely accounting for temporal advances observed in some of the traits. However, there was no evidence for temporal changes in key female reproductive performance traits (offspring birth weight and offspring survival) in this population, despite significant relationships between these traits and female phenology. In males, average antler weights increased over time presumably as a result of improved resource availability and physiological condition through spring and summer. There was no evidence for any temporal change in average male annual breeding success, as might be expected if the timing of male rutting behaviour was failing to track advances in the timing of oestrus in females. Our results provide rare evidence linking phenological advances to climate warming in a wild mammal and highlight the potential complexity of relationships between climate warming, phenology and demography in wild vertebrates.
Date JUL 2011
Language English
Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:03
Extra Place: Hoboken Publisher: Wiley WOS:000291221000015
Volume 17
Pages 2455-2469
Publication Global Change Biology
DOI 10.1111/j.1365-2486.2010.02382.x
Issue 7
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

cervus-elaphus, climate warming, climate-change, consequences, demography, density, inference, mammal, parentage, phenology, phenotypic plasticity, plant growth, reproductive fitness, sexual selection, survival, ungulate, variability

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Age-dependent patterns of spatial autocorrelation in fish populations

Type Journal Article
Author Jonatan F. Marquez
Author Bernt-Erik Saether
Author Sondre Aanes
Author Steinar Engen
Author Are Salthaug
Author Aline Magdalena Lee
Abstract The degree of spatial autocorrelation in population fluctuations increases with dispersal and geographical covariation in the environment, and decreases with strength of density dependence. Because the effects of these processes can vary throughout an individual's lifespan, we studied how spatial autocorrelation in abundance changed with age in three marine fish species in the Barents Sea. We found large interspecific differences in age-dependent patterns of spatial autocorrelation in density. Spatial autocorrelation increased with age in cod, the reverse trend was found in beaked redfish, while it remained constant among age classes in haddock. We also accounted for the average effect of local cohort dynamics, i.e. the expected local density of an age class given last year's local density of the cohort, with the goal of disentangling spatial autocorrelation patterns acting on an age class from those formed during younger age classes and being carried over. We found that the spatial autocorrelation pattern of older age classes became increasingly determined by the distribution of the cohort during the previous year. Lastly, we found high degrees of autocorrelation over long distances for the three species, suggesting the presence of far-reaching autocorrelating processes on these populations. We discuss how differences in the species' life history strategies could cause the observed differences in age-specific variation in spatial autocorrelation. As spatial autocorrelation can differ among age classes, our study indicates that fluctuations in age structure can influence the spatio-temporal variation in abundance of marine fish populations.

Date DEC 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:05
Extra Place: Hoboken Publisher: Wiley WOS:000700113400001
Volume 102
Pages e03523
Publication Ecology
DOI 10.1002/ecy.3523
Issue 12
Journal Abbr Ecology
ISSN 0012-9658
Date Added 15/03/2023, 14:27:14
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Tags:

age segregation, age structure, age truncation, Barents Sea, beaked redfish, cohort dynamics, cohort spatial distribution, dispersal, dynamics, extinction, fluctuations, life stage, north-atlantic, scale, sebastes-mentella, spatial autocorrelation, spatial dynamics, spatial variance, structured population, synchrony

Attachments

- Full Text

Age-specific response of a migratory bird to an experimental alteration of its habitat

Type Journal Article

Author Samuel Hache
Author Marc-Andre Villard

Abstract P>1. Recruitment, i.e. the influx of new breeding individuals into a population, is an important demographic parameter, especially in species with a short life span. Few studies have measured this parameter in solitary-breeding animal populations even though it may yield critical information on habitat suitability and functional connectivity. 2. Using a before-after, control-impact pairs (BACIP) experimental design, we measured: (i) the return rate and apparent survival rate of individually marked territorial males of a neotropical migrant bird species, the Ovenbird Seiurus aurocapilla Linnaeus and (ii) the age-specific recruitment rate. Study plots (n = 10) were paired: one was treated through single-tree selection harvesting (30-40% basal area removal) and the other acted as a control. We hypothesized that experienced males would out-compete inexperienced ones and tend to avoid settling in lower-quality, treated stands. 3. In the first year post-harvest, the mean density of territorial males was significantly lower in treated plots (-41%) than in controls and the difference remained relatively stable thereafter. This lower density mainly reflected a lower recruitment rate compared to controls (17 center dot 9 vs. 49 center dot 0% of males present), itself driven by a lower recruitment rate of experienced males (2 center dot 8 vs. 22 center dot 8%). Return rate was similar between controls and treated plots in the first year post-harvest (59 vs. 55%, respectively) but it decreased in treated plots during the second (-15 center dot 8% relative to controls) and third (-12 center dot 7%) year post-harvest. The trend was even stronger when considering only experienced males. The treatment was followed by a major expansion in mean territory size in treated plots (+49% relative to controls, 3rd year post-treatment). 4. Neither apparent survival rate nor recruitment rate varied as predicted. There was a strong year effect but no treatment effect on apparent survival rate, whereas male recruitment patterns were both year- and age-specific. Three years post-harvest, recruitment rate was sufficient to fill most territory vacancies in treated plots, due mainly to first-time breeders. 5. To our knowledge, this is the first study documenting the effects of experimental habitat alteration on recruitment rate in a songbird species using a BACI design. The response of this male subpopulation highlights the influence of recruitment on the density of open populations of solitary-nesting birds and age-specific patterns in the response of individuals to habitat alterations.

Date	JUL 2010
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:28:27
Extra	Place: Hoboken Publisher: Wiley WOS:000278399300020
Volume	79
Pages	897-905
Publication	Journal of Animal Ecology
DOI	10.1111/j.1365-2656.2010.01694.x
Issue	4
Journal Abbr	J. Anim. Ecol.
ISSN	0021-8790
Date Added	15/03/2023, 14:28:28
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Tags:

breeding dispersal, disrupted dispersal, forest management, habitat selection, ideal despotic distribution, long-distance, male ovenbirds, managed forest landscapes, neotropical migrant bird, new-brunswick, quantitative targets, recruitment, reproductive success, territory size, time-lagged response

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Alien and native plant life-forms respond differently to human and climate pressures

Type	Journal Article
Author	Lorenzo Marini
Author	Andrea Battisti
Author	Enzo Bona
Author	Germano Federici
Author	Fabrizio Martini
Author	Marco Pautasso
Author	Philip E. Hulme

Abstract Aim To investigate whether differences in the elevational trend in native and alien species richness were dependent on climate or human pressures. Specifically we tested whether life-form and/or alien/native status modifies the response of plant species richness to human population and temperature along: (1) a complete elevational gradient, and (2) within separate elevational bands that, by keeping temperature within a narrow range, elucidate the effects of human pressures more clearly. Location Two provinces (c. 7507 km(2)) on the southern border of the European Alps (Italy), subdivided into 240 contiguous sampling cells (c. 35.7 km(2)). Methods We used an extensive dataset on alien and native species richness across an elevation gradient (20-2900 m a.s.l.). Richness of natives and naturalized aliens were separately related to temperature, human population and Raunkiaer life-form using general linear mixed models. Life-formdescribes different plant strategies for survival during seasons with adverse cold/arid conditions. Results The relationship between species richness and temperature for natives was strongly dependent on life-form, while aliens showed a consistent positive trend. Similar trends across alien and native life-forms were found for the relationship between species richness and human population along the whole gradient and within separate elevational bands. Main conclusions The absence of life-form-dependent responses amongst aliens supports the hypothesis that the distribution of alien plant species richness was more related to propagule pressure and availability of novel niches created by human activities than to climatic filtering. While climate change will potentially contribute to relaxing species thermal constraints, the response of alien species to future warming will also be contingent on changes in anthropogenic pressures.

Date MAY 2012
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:50:53
Extra Place: Malden Publisher: Wiley-Blackwell WOS:000302397900003
Volume 21
Pages 534-544
Publication Global Ecology and Biogeography
DOI 10.1111/j.1466-8238.2011.00702.x
Issue 5
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
Date Added 15/03/2023, 14:51:19
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Tags:

altitudinal gradient, Biological invasion, biological invasions, canary-islands, distributions, disturbance, elevation gradient, elevational gradients, flora, global change, global warming, herbaceous vegetation, human impact, Italy, land-use change, mountain, propagule pressure, species richness, urbanization, weeds

Ambient climate determines the directional trend of community stability under warming and grazing

Type Journal Article
Author Peipei Liu
Author Wangwang Lv
Author Jianping Sun
Author Caiyun Luo
Author Zhenhua Zhang
Author Xiaoxue Zhu
Author Xingwu Lin
Author Jichuang Duan
Author Guangping Xu
Author Xiaofeng Chang
Author Yigang Hu
Author Qiaoyan Lin
Author Burenbayin Xu
Author Xiaowei Guo
Author Lili Jiang
Author Yanfen Wang
Author Shilong Piao
Author Jinzhi Wang
Author Haishan Niu
Author Liyong Shen
Author Yang Zhou
Author Bowen Li
Author Lirong Zhang
Author Huan Hong
Author Qi Wang
Author A. Wang
Author Suren Zhang
Author Lu Xia
Author Tsechoe Dorji
Author Yingnian Li
Author Guangming Cao
Author Josep Penuelas
Author Xinquan Zhao
Author Shiping Wang

Abstract Changes in ecological processes over time in ambient treatments are often larger than the responses to manipulative treatments in climate change experiments. However, the impacts of human-driven environmental changes on the stability of natural grasslands have been typically assessed by comparing differences between manipulative plots and reference plots. Little is known about whether or how ambient climate regulates the effects of manipulative treatments and their underlying mechanisms. We collected two datasets, one a 36-year long-term observational dataset from 1983 to 2018, and the other a 10-year manipulative asymmetric warming and grazing experiment using infrared heaters with moderate grazing from 2006 to 2015 in an alpine meadow on the Tibetan Plateau. The 36-year observational dataset shows that there was a nonlinear response of community stability to ambient temperature with a positive relationship between them due to an increase in ambient temperature in the first 25 years and then a decrease in ambient temperature thereafter. Warming and grazing decreased community stability with experiment duration through an increase in legume cover and a decrease in species asynchrony, which was due to the decreasing background temperature through time during the 10-year experiment period. Moreover, the temperature sensitivity of community stability was higher under the ambient treatment than under the manipulative treatments. Therefore, our results suggested that ambient climate may control the directional trend of community stability while manipulative treatments may determine the temperature sensitivity of the response of community stability to climate relative to the ambient treatment. Our study emphasizes the importance of the context dependency of the response of community stability to human-driven environmental changes.

Date OCT 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:46
Extra Place: Hoboken Publisher: Wiley WOS:000678721200001
Volume 27
Pages 5198-5210
Publication Global Change Biology
DOI 10.1111/gcb.15786
Issue 20
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

alpine meadow, asymmetric warming, biodiversity, community stability, context dependence, context dependency, diversity, ecosystem stability, management, moderate grazing, plant functional group, population, productivity, species asynchrony, species composition, species diversity, temporal stability, Tibetan Plateau

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Amphibian breeding phenology trends under climate change: predicting the past to forecast the future

Type Journal Article
Author David M. Green
Abstract Global climate warming is predicted to hasten the onset of spring breeding by anuran amphibians in seasonal environments. Previous data had indicated that the breeding phenology of a population of Fowler's Toads (Anaxyrus fowleri) at their northern range limit had been progressively later in spring, contrary to generally observed trends in other species. Although these animals are known to respond to environmental temperature and the lunar cycle to commence breeding, the timing of

breeding should also be influenced by the onset of overwintering animals' prior upward movement through the soil column from beneath the frost line as winter becomes spring. I used recorded weather data to identify four factors of temperature, rainfall and snowfall in late winter and early spring that correlated with the toads' eventual date of emergence aboveground. Estimated dates of spring emergence of the toads calculated using a predictive model based on these factors, as well as the illumination of the moon, were highly correlated with observed dates of emergence over 24 consecutive years. Using the model to estimate of past dates of spring breeding (i.e. retrodiction) indicated that even three decades of data were insufficient to discern any appreciable phenological trend in these toads. However, by employing weather data dating back to 1876, I detected a significant trend over 140years towards earlier spring emergence by the toads by less than half a day/decade, while, over the same period of time, average annual air temperature and annual precipitation had both increased. Changes in the springtime breeding phenology for late-breeding species, such as Fowler's Toads, therefore may conform to expectations of earlier breeding under global warming. Improved understanding of the environmental cues that bring organisms out of winter dormancy will enable better interpretation of long-term phenological trends.

Date FEB 2017
Language English
Short Title Amphibian breeding phenology trends under climate change
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:50:49
Extra Place: Hoboken Publisher: Wiley-Blackwell WOS:000394343300017
Volume 23
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Tags:

1st spawning dates, Anaxyrus fowleri, calling phenology, climate change, common toads, community, environmental-factors, Fowler's Toad, freeze tolerance, frog rana-temporaria, global warming, great-lakes, long-term study, spring emergence, temperature, toads bufo-bufo

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Amphibian sensitivity to habitat modification is associated with population trends and species traits

Type Journal Article
Author A. Justin Nowakowski
Author Michelle E. Thompson
Author Maureen A. Donnelly

Author Brian D. Todd

Abstract Aim: Habitat modification is causing widespread declines in biodiversity and the homogenization of biotas. Amphibians are especially threatened by habitat modification, yet we know little about why some species persist or thrive in the face of this threat whereas others decline. Our aim was to identify intrinsic factors that explain variation among amphibians in their sensitivity to habitat modification (SHM), factors that could help target groups of species for conservation. Location: Global. Time period: 1986-2015 Major taxon studied: Amphibians. Methods: We quantified SHM using species abundances in natural and altered habitats as reported in published field surveys. We first examined associations between local SHM and range-wide threatened status, population trends and invasiveness. We then evaluated the importance of intrinsic and extrinsic variables in explaining species SHM using multiple comparative methods. Our analyses included over 200 species that could be ranked with confidence from 47 studies across five continents. Results: Amphibians species varied considerably in local SHM. High SHM was associated with elevated range-wide extinction risk and declining population trends. Species that were tolerant of habitat modification were most likely to be invasive outside their native range. Geographical range size was the most important intrinsic predictor and was negatively associated with SHM. Larval habitat was also an important predictor, but was tightly coupled with phylogenetic position. Main conclusions: Narrowly distributed species whose larvae develop on land or in lotic habitats are most sensitive to habitat modification. However, other unmeasured, phylogenetically constrained traits could underlie the effect of larval habitat. Species range size is frequently correlated with global extinction risk in vertebrates, and our analysis extends this macroecological pattern to the sensitivity of amphibians to local habitat loss, a proximate driver of extinction. These general patterns of SHM should help identify those groups of amphibians most at risk in an era of rapid habitat loss and scarce conservation resources.

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Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
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Volume 26
Pages 700-712
Publication Global Ecology and Biogeography
DOI 10.1111/geb.12571
Issue 6
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Tags:

biodiversity, biotic homogenization, body-size, conservation, extinction risk, habitat loss, land use, land-use, life history, matrix tolerance, niche breadth, range, reproductive modes, responses, specialization, species traits, susceptibility, threatened, tropical amphibians

Attachments

- Submitted Version

Anthropogenic drivers of avian community turnover from local to regional scales

Type Journal Article

Author Grace J. Di Cecco

Author Allen H. Hurlbert

Abstract Anthropogenic change has altered the composition and function of ecological communities across the globe. As a result, there is a need for studies examining observed community compositional change and determining whether and how anthropogenic change drivers may be influencing that turnover. In particular, it is also important to determine to what extent community turnover is idiosyncratic or if turnover can be explained by predictable responses across species based on traits or niche characteristics. Here, we measured turnover in avian communities across North America from 1990 to 2016 in the Breeding Bird Survey using an ordination method, and modeled turnover as a function of land use and climate change drivers from local to regional scales. We also examined how turnover may be attributed to species groups, including foraging guilds, trophic groups, migratory distance, and breeding biomes. We found that at local scales, land use change explained a greater proportion of variance in turnover than climate change variables, while as scale increased, trends in temperature explained a greater proportion of variance in turnover. We also found across the study region, turnover could be attributed to one of a handful of species undergoing strong expansions or strong declines over the study time period. We did not observe consistent patterns in compositional change in any trait groups we examined except for those that included previously identified highly influential species. Our results have two important implications: First, the relative importance of different anthropogenic change drivers may vary with scale, which should be considered in studies' modeling impacts of global change on biodiversity. Second, in North American avian communities, individual species undergoing large shifts in population may drive signals in compositional change, and composite community turnover metrics should be carefully selected as a result.

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Language English

Library Catalogue Web of Science Nextgen

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Tags:

abundance, biodiversity change, birds, climate change, climate-change, decline, diversity, dynamics, expansion, land use, occupancy, spatial scaling, temporal turnover, time, traits, turnover

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Arbuscular mycorrhizal fungal diversity and natural enemies promote coexistence of tropical tree species

Type	Journal Article
Author	Benedicte Bachelot
Author	Mara Uriarte
Author	Krista L. McGuire
Author	Jill Thompson
Author	Jess Zimmerman
Abstract	Negative population feedbacks mediated by natural enemies can promote species coexistence at the community scale through disproportionate mortality of numerically dominant (common) tree species. Simultaneously, associations with arbuscular mycorrhizal fungi (AMF) can result in positive effects on tree populations. Coupling data on seedling foliar damage from herbivores and pathogens and DNA sequencing of soil AMF diversity, we assessed the effects of these factors on tree seedling mortality at local (1 m(2)) and community (16 ha plot) scales in a tropical rainforest in Puerto Rico. At the local scale, AMF diversity in soil counteracted negative effects from foliar damage on seedling mortality. At the community scale, mortality of seedlings of common tree species increased with foliar damage while rare tree species benefited from soil AMF diversity. Together, the effects of foliar damage and soil AMF diversity on seedling mortality might foster tree species coexistence in this forest.
Date	MAR 2017
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:31
Extra	Place: Hoboken Publisher: Wiley WOS:000395824000012
Volume	98
Pages	712-720
Publication	Ecology
DOI	10.1002/ecy.1683
Issue	3
Journal Abbr	Ecology
ISSN	0012-9658
Date Added	15/03/2023, 14:29:40
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Tags:

arbuscular mycorrhizal fungi, coexistence, colonization, communities, community compensatory trend, density-dependence, dynamics, forest, Janzen Connell hypothesis, land-use, mortality, plant, rare, seedling mortality, spatial-patterns, tropical forest

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Arctic greening from warming promotes declines in caribou populations

Type	Journal Article
Author	Per Fauchald
Author	Taejin Park
Author	Hans Tommervik
Author	Ranga Myneni
Author	Vera Helene Hausner
Abstract	The migratory tundra caribou herds in North America follow decadal population cycles, and browsing from abundant caribou could be expected to counteract the current climate-driven expansion of shrubs in the circumpolar tundra biome. We demonstrate that the sea ice cover in the Arctic Ocean has provided a strong signal for climate-induced changes on the adjacent caribou summer ranges, outperforming other climate indices in explaining the caribou-plant dynamics. We found no evidence of a negative effect of caribou abundance on vegetation biomass. On the contrary, we found a strong bottom-up effect in which a warmer climate related to diminishing sea ice has increased the plant biomass on the summer pastures, along with a paradoxical decline in caribou populations. This result suggests that this climate-induced greening has been accompanied by a deterioration of pasture quality. The shrub expansion in Arctic North America involves plant species with strong antibrowsing defenses. Our resultsmight therefore be an early signal of a climate-driven shift in the caribou-plant interaction from a system with low plant biomass modulated by cyclic caribou populations to a system dominated by nonedible shrubs and diminishing herds of migratory caribou.
Date	APR 2017
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:28:05
Extra	Place: Washington Publisher: Amer Assoc Advancement Science WOS:000401954800006
Volume	3
Pages	e1601365
Publication	Science Advances
DOI	10.1126/sciadv.1601365
Issue	4
Journal Abbr	Sci. Adv.
ISSN	2375-2548
Date Added	15/03/2023, 14:28:28
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Tags:

climate, community, herbivores, plant phenology, productivity, sea-ice decline, time-series, trends, tundra vegetation change

Attachments

- Full Text

Arthropods are not declining but are responsive to disturbance in the Luquillo Experimental Forest, Puerto Rico

Type	Journal Article
Author	Timothy D. Schowalter
Author	Manoj Pandey
Author	Steven J. Presley
Author	Michael R. Willig
Author	Jess K. Zimmerman
Abstract	A number of recent studies have documented long-term declines in abundances of important arthropod groups, primarily in Europe and North America. These declines are generally attributed to habitat loss, but a recent study [B.C. Lister, A. Garcia, Proc. Natl. Acad. Sci. USA 115, E10397-E10406 (2018)] from the Luquillo Experimental Forest (LEF) in Puerto Rico attributed declines to global warming. We analyze arthropod data from the LEF to evaluate long-term trends within the context of hurricane-induced disturbance, secondary succession, and temporal variation in temperature. Our analyses demonstrate that responses to hurricane-induced disturbance and ensuing succession were the primary factors that affected total canopy arthropod abundances on host trees, as well as walkingstick abundance on understory shrubs. Ambient and understory temperatures played secondary roles for particular arthropod species, but populations were just as likely to increase as they were to decrease in abundance with increasing temperature. The LEF is a hurricane-mediated system, with major hurricanes effecting changes in temperature that are larger than those induced thus far by global climate change. To persist, arthropods in the LEF must contend with the considerable variation in abiotic conditions associated with repeated, large-scale, and increasingly frequent pulse disturbances. Consequently, they are likely to be well-adapted to the effects of climate change, at least over the short term. Total abundance of canopy arthropods after Hurricane Maria has risen to levels comparable to the peak after Hurricane Hugo. Although the abundances of some taxa have declined over the 29-y period, others have increased, reflecting species turnover in response to disturbance and secondary succession.
Date	JAN 12 2021
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:26:43
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000607277100013
Volume	118
Pages	e2002556117
Publication	Proceedings of the National Academy of Sciences of the United States of America

DOI 10.1073/pnas.2002556117
Issue 2
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
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Tags:

age, canopy, disturbance, dynamics, gastropod populations, global warming, hurricane, insect decline, invertebrate communities, large-scale, phasmatodea, plants, species turnover, terrestrial

Attachments

- Full Text

Assessing the combined threats of artificial light at night and air pollution for the world's nocturnally migrating birds

Type Journal Article
Author Frank A. La Sorte
Author Myla F. J. Aronson
Author Christopher A. Lepczyk
Author Kyle G. Horton
Abstract Aim Two important environmental hazards for nocturnally migrating birds are artificial light at night (ALAN) and air pollution, with ambient fine particulate matter (PM2.5) considered to be especially harmful. Nocturnally migrating birds are attracted to ALAN during seasonal migration, which could increase exposure to PM2.5. Here, we examine PM2.5 concentrations and PM2.5 trends and the spatial correlation between ALAN and PM2.5 within the geographical ranges of the world's nocturnally migrating birds. Location Global. Time period 1998-2018. Major taxa studied Nocturnally migrating birds. Methods We intersected a global database of annual mean PM2.5 concentrations over a 21-year period (1998-2018) with the geographical ranges (breeding, non-breeding and regions of passage) of 225 nocturnally migrating bird species in three migration flyways (Americas, n = 143; Africa-Europe, n = 36; and East Asia-Australia, n = 46). For each species, we estimated PM2.5 concentrations and trends and measured the correlation between ALAN and PM2.5, which we summarized by season and flyway. Results Correlations between ALAN and PM2.5 were significantly positive across all seasons and flyways. The East Asia-Australia flyway had the strongest ALAN-PM2.5 correlations within regions of passage, the highest PM2.5 concentrations across all three seasons and the strongest positive PM2.5 trends on the non-breeding grounds and within regions of passage. The Americas flyway had the strongest negative air pollution trends on the non-breeding grounds and within regions of passage. The breeding grounds had similarly negative air pollution trends within the three flyways. Main conclusions The combined threats of ALAN and air pollution are greatest and likely to be increasing within the East Asia-Australia flyway and lowest and likely to be decreasing within the Americas and Africa-Europe flyways. Reversing PM2.5 trends in the East Asia-Australia flyway and maintaining negative PM2.5 trends in the Americas and Africa-Europe flyways while reducing ALAN levels would likely be beneficial for the nocturnally migrating bird populations in each region.

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Language English
Library Catalogue Web of Science Nextgen
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air pollution, benzene, consequences, fine particulate matter, light pollution, migration flyway, migratory birds, models, nitrogen-dioxide, nocturnal migration, particles, seasonal migration, seasonality, toluene, vertical-distribution

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Asynchronous changes in abundance over large scales are explained by demographic variation rather than environmental stochasticity in an invasive flagellate

Type Journal Article
Author Cristina Trigal
Author Alejandro Ruete
Abstract Environmental stochasticity is important in explaining the persistence and establishment of invasive species, but the simultaneous effects of environmental and demographic factors are difficult to separate. Understanding how demography and environmental factors affect invasive species abundance over large temporal and spatial scales is essential to anticipate populations at risk of becoming established and setting appropriate management measures. Using a hierarchical mixed modelling approach, we analysed the spatial and interannual dynamics of the invasive raphidophyte Gonyostomum semen, a noxious flagellate which is spreading in northern Europe, in response to demographic and environmental variation. We used data from 76 lakes distributed across two biogeographical regions in Sweden (Central Plains in the south and Fennoscandian region in the north) and sampled during 14years. We found a strong asynchrony in the density dynamics of G. semen populations between the two regions. G. semen showed positive trends (i.e. increasing frequency of high density peaks) in most southern lakes, forming established populations with recurrent blooms in successive years in some of them. In contrast, G. semen populations were smaller and more stochastic in the north.G. semen previous year's abundance, a proxy for cyst production and recruitment, had a strong control on the dynamics, likely contributing to the stability of high density populations in southern lakes. Conversely, the effects of climate and habitat were

weaker and their influence varied across regions. Temperature was the limiting factor in the north whereas local habitat was more important in the south.Synthesis. A full understanding of the mechanisms driving abundance changes across large scales can only be gained if endogenous and environmental factors are analysed together. For phytoplankton species, and specially, noxious microalgae, this implies that proxies for cyst production and recruitment, which are the inoculum for next year population, should be included in e.g. distribution, bloom formation and climate models, as these may modify establishment and population response to environmental variation. Asynchronous changes in abundance across regions also indicate that management plans should be developed for small regions, as inference at a large scale may obscure the mechanisms driving local population changes.

Date JUL 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
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Volume 104
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DOI 10.1111/1365-2745.12576
Issue 4
Journal Abbr J. Ecol.
ISSN 0022-0477
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Tags:

aquatic plant ecology, biogeography, bloom formation, boreal lakes, climate, cylindrospermopsis-raciborskii, demographic stochasticity, didymosphenia-geminata, dinoflagellate cysts, dynamics, early-warning signals, environmental stochasticity, gonyaulax-tamarensis, Gonyostomum semen, gonyostomum-semen raphidophyceae, invasive species, lakes, microalgae, responses

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Avian body size changes and climate change: warming or increasing variability?

Type Journal Article

Author Rae E. Goodman
Author Gretchen Lebuhn
Author Nathaniel E. Seavy
Author Thomas Gardali
Author Jill D. Bluso-Demers

Abstract There has been a growing interest in whether established ecogeographical patterns, such as Bergmann's rule, explain changes in animal morphology related to climate change. Bergmann's rule has often been used to predict that body size will decrease as the climate warms, but the predictions about how body size will change are critically dependent on the mechanistic explanation behind the rule. To investigate change in avian body size in western North America, we used two long-term banding data sets from central California, USA; the data spanned 40 years (19712010) at one site and 27 years (19832009) at the other. We found that wing length of birds captured at both sites has been steadily increasing at a rate of 0.0240.084% per year. Although changes in body mass were not always significant, when they were, the trend was positive and the magnitudes of significant trends were similar to those for wing length (0.0400.112% per year). There was no clear difference between the rates of change of long-distance vs. short-distance migrants or between birds that bred locally compared to those that bred to the north of the sites. Previous studies from other regions of the world have documented decreases in avian body size and have used Bergmann's rule and increases in mean temperature to explain these shifts. Because our results do not support this pattern, we propose that rather than responding to increasing mean temperatures, avian body size in central California may be influenced by changing climatic variability or changes in primary productivity. More information on regional variation in the rates of avian body size change will be needed to test these hypotheses.

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Language	English
Short Title	Avian body size changes and climate change
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:05
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Publication	Global Change Biology
DOI	10.1111/j.1365-2486.2011.02538.x
Issue	1
Journal Abbr	Glob. Change Biol.
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Bergmann's Rule, bergmanns rule, body mass, California, climatic variability, ecogeographic rules, ecotypic variation, energy reserves, extremes, metaanalysis, migrants, migration, morphology, passerine birds, patterns, population, sparrows, temperature, wing length

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Bioclimatic context of species' populations determines community stability

Type	Journal Article
Author	Luke Christopher Evans
Author	Yolanda Melero
Author	Reto Schmucki
Author	Philipp H. Boersch-Supan
Author	Lluis Brotons
Author	Colin Fontaine
Author	Frederic Jiguet

Author Mikko Kuussaari
Author Dario Massimino
Author Robert A. Robinson
Author David B. Roy
Author Oliver Schweiger
Author Josef Settele
Author Constanti Stefanescu
Author Chris A. M. van Turnhout
Author Tom Henry Oliver

Abstract Aim It is important to understand the factors affecting community stability because ecosystem function is increasingly at risk from biodiversity loss. Here, we evaluate how a key factor, the position of local environmental conditions within the thermal range of the species, influences the stability of butterfly communities at a continental scale. Location Spain, UK and Finland. Time period 1999-2017. Major taxa studied Butterflies. Methods We tested the following hypotheses about how species responses to temperature anomalies aggregate to influence stability: Hypothesis 1, species have contrasting responses to local temperature anomalies at opposing edges of their thermal range; hypothesis 2, communities with central thermal range positions have higher community stability; and the impacts of thermal range position on community stability are driven by hypothesis 3, population asynchrony, or hypothesis 4, additive population stability. Data were analysed at 876 sites for 157 species. Results We found some support for hypothesis 1, because there were interactions between thermal range and response to temperature anomalies such that species at different range edges could provide weak compensatory dynamics. However, responses were nonlinear, suggesting strong declines with extreme anomalies, particularly at the hot range edge. Hypothesis 2 was supported in part, because community stability increased with central thermal range positions and declined at the edges, after accounting for species richness and community abundance. Thermal range position was weakly correlated with asynchrony (hypothesis 3) and population stability (hypothesis 4), although species richness and population abundance had larger impacts. Main conclusions Future extreme heat events will be likely to impact species negatively across their thermal range, but might be particularly impactful on populations at the hottest end of the thermal range. Thermal range position influenced community stability because range edge communities were stable. However, the prediction of community stability from thermal range position is challenging because of nonlinear responses to temperature, with small temperature anomalies producing weak compensatory dynamics, but large extreme events synchronizing dynamics.

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Language English
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URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
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abundance, asynchrony, biodiversity, biogeography, british butterflies, butterfly populations, climate-change, community stability, diversity, diversity-stability, ecosystem stability, insects, integrated Laplace approximation, life stages, long-term monitoring, niche centrality, range position, statistical inevitability, trends

Attachments

- Full Text

BioTIME: A database of biodiversity time series for the Anthropocene

Type	Journal Article
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Author	Faye Moyes
Author	Amanda E. Bates
Author	Anne E. Magurran
Author	Dusan Adam
Author	Asem A. Akhmetzhanova
Author	Ward Appeltans
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Author	Haley Arnold
Author	Narayanan Ayyappan
Author	Gal Badihi
Author	Andrew H. Baird
Author	Miguel Barbosa
Author	Tiago Egydio Barreto
Author	Claus Baessler
Author	Alecia Bellgrove
Author	Jonathan Belmaker
Author	Lisandro Benedetti-Cecchi
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Author	Matt Bradford
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Author Christoph F. J. Meyer
Author Anders Michelsen
Author Nataliya Milchakova
Author Tom Moens
Author Even Moland
Author Jon Moore
Author Carolina Mathias Moreira
Author Joerg Mueller
Author Grace Murphy
Author Isla H. Myers-Smith
Author Randall W. Myster
Author Andrew Naumov
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Author Michael Paul Nelson
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Author Alejandro Perez-Matus
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Author Jose Eduardo Rebelo
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Author Itai van Rijn
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Author Christian Rixen
Author Kevin P. Robinson
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Author Sara Scanga
Author Jochen Schmidt
Author Robert Schooley
Author Fakhrizal Setiawan
Author Kwang-Tsao Shao
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Author Gabriel B. G. Souza
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Author Yzel Rondon Suarez
Author Sarah Supp
Author Jorge Yoshio Tamashiro
Author Sukmaraharja Tarigan
Author Gary P. Thiede
Author Simon Thorn
Author Anne Tolvanen
Author Maria Teresa Zugliani Toniato
Author Orjan Totland
Author Robert R. Twilley
Author Gediminas Vaitkus
Author Nelson Valdivia
Author Martha Isabel Vallejo
Author Thomas J. Valone
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Author Fabio Venturoli
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Author Rui P. Vieira
Author Tomas Vrska
Author Con Quang Vu
Author Lien Van Vu
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Author Sara Webb
Author Tomasz Wesolowski
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Author Claire E. Widdicombe
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Author Richard Williams
Author Stefan B. Williams
Author Mark Williamson
Author Michael R. Willig
Author Trevor J. Willis

Author Sonja Wipf
Author Kerry D. Woods
Author Eric J. Woehler
Author Kyle Zawada
Author Michael L. Zettler

Abstract Motivation: The BioTIME database contains raw data on species identities and abundances in ecological assemblages through time. These data enable users to calculate temporal trends in biodiversity within and amongst assemblages using a broad range of metrics. BioTIME is being developed as a community-led open-source database of biodiversity time series. Our goal is to accelerate and facilitate quantitative analysis of temporal patterns of biodiversity in the Anthropocene. Main types of variables included: The database contains 8,777,413 species abundance records, from assemblages consistently sampled for a minimum of 2 years, which need not necessarily be consecutive. In addition, the database contains metadata relating to sampling methodology and contextual information about each record. Spatial location and grain: BioTIME is a global database of 547,161 unique sampling locations spanning the marine, freshwater and terrestrial realms. Grain size varies across datasets from 0.0000000158 km(2) (158 cm(2)) to 100 km(2) (1,000,000,000,000 cm(2)). Time period and grainBio: TIME records span from 1874 to 2016. The minimal temporal grain across all datasets in BioTIME is a year. Major taxa and level of measurement: BioTIME includes data from 44,440 species across the plant and animal kingdoms, ranging from plants, plankton and terrestrial invertebrates to small and large vertebrates.

Date JUL 2018
Language English
Short Title BioTIME
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:06
Extra Place: Hoboken Publisher: Wiley WOS:000439785700001
Volume 27
Pages 760-786
Publication Global Ecology and Biogeography
DOI 10.1111/geb.12729
Issue 7
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

bialowieza national-park, biodiversity, bird community dynamics, deciduous forest, estuarine coastal lagoon, global, land-bridge islands, long-term change, population trends, primeval temperate forest, secondary forest, simulated herbivory, spatial, species richness, temporal, turnover

Attachments

- Full Text

Body size-dependent responses of a marine fish assemblage to climate change and fishing over a century-long scale

Type	Journal Article
Author	Martin J. Genner
Author	David W. Sims
Author	Alan J. Southward
Author	Georgina C. Budd
Author	Patricia Masterson
Author	Matthew Mchugh
Author	Peter Rendle
Author	Emily J. Southall
Author	Victoria J. Wearmouth
Author	Stephen J. Hawkins
Abstract	Commercial fishing and climate change have influenced the composition of marine fish assemblages worldwide, but we require a better understanding of their relative influence on long-term changes in species abundance and body-size distributions. In this study, we investigated long-term (1911-2007) variability within a demersal fish assemblage in the western English Channel. The region has been subject to commercial fisheries throughout most of the past century, and has undergone interannual changes in sea temperature of over 2.0 degrees C. We focussed on a core 30 species that comprised 99% of total individuals sampled in the assemblage. Analyses showed that temporal trends in the abundance of smaller multispecies size classes followed thermal regime changes, but that there were persistent declines in abundance of larger size classes. Consistent with these results, larger-growing individual species had the greatest declines in body size, and the most constant declines in abundance, while abundance changes of smaller-growing species were more closely linked to preceding sea temperatures. Together these analyses are suggestive of dichotomous size-dependent responses of species to long-term climate change and commercial fishing over a century scale. Small species had rapid responses to the prevailing thermal environment, suggesting their life history traits predisposed populations to respond quickly to changing climates. Larger species declined in abundance and size, reflecting expectations from sustained size-selective overharvesting. These results demonstrate the importance of considering species traits when developing indicators of human and climatic impacts on marine fauna.
Date	FEB 2010
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:13
Extra	Place: Malden Publisher: Wiley-Blackwell Publishing, Inc WOS:000274419400003
Volume	16
Pages	517-527
Publication	Global Change Biology
DOI	10.1111/j.1365-2486.2009.02027.x
Issue	2
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19

Modified 15/03/2023, 14:51:19

Tags:

climate change, community, ecosystem, fisheries, growth-rates, indicators, life history traits, marine monitoring, north-sea cod, ocean, overfishing, structural-change, temperature, term, western english-channel

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Bottom-up processes influence the demography and life-cycle phenology of Hawaiian bird communities

Type	Journal Article
Author	Jared D. Wolfe
Author	C. John Ralph
Author	Andrew Wiegardt
Abstract	Changes in climate can indirectly regulate populations at higher trophic levels by influencing the availability of food resources in the lower reaches of the food web. As such, species that rely on fruit and nectar food resources may be particularly sensitive to these bottom-up perturbations due to the strength of their trophic linkages with climatically-influenced plants. To measure the influence of climatically-mediated, bottom-up processes, we used climate, bird capture, bird count, and plant phenology data from the Big Island of Hawaii to construct a series of structural equationand abundance models. Our results suggest that fruit and nectar-eating birds arrange life cycle events around climatically-influenced food resources, while some of these same food resources also influence seasonal patterns of abundance. This trend was particularly strong for two native nectarivores, 'I'iwi and 'Apapane, where we found that the dissimilar timing of molting and breeding activity was associated with peak abundance of the two most common flowers at our study site which, in turn, were each driven by dissimilar climatic cues. Given the rapidly changing Hawaiian climate, we suggest that determining behavioral plasticity, or evolutionary capacity of birds to mitigate changes in climatically-influenced food resources, should be recognized as a future research priority.
Date	NOV 2017
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:26:51
Extra	Place: Hoboken Publisher: Wiley WOS:000414242600013
Volume	98
Pages	2885-2894
Publication	Ecology
DOI	10.1002/ecy.1981
Issue	11
Journal Abbr	Ecology
ISSN	0012-9658
Date Added	15/03/2023, 14:27:14
Modified	15/03/2023, 14:27:14

Tags:

bottom-up, climate, climate-change, community ecology, el-nino events, food web, forces, forest, Hawaiian birds, long-term, patterns, plant phenology, predator, responses, shifts, structural equationmodels, top-down

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Can dynamic occupancy models improve predictions of species' range dynamics? A test using Swiss birds

Type	Journal Article
Author	Natalie J. Briscoe
Author	Damaris Zurell
Author	Jane Elith
Author	Christian Koenig
Author	Guillermo Fandos
Author	Anne-Kathleen Malchow
Author	Marc Kery
Author	Hans Schmid
Author	Gurutzeta Guillera-Arroita
Abstract	Predictions of species' current and future ranges are needed to effectively manage species under environmental change. Species ranges are typically estimated using correlative species distribution models (SDMs), which have been criticized for their static nature. In contrast, dynamic occupancy models (DOMs) explicitily describe temporal changes in species' occupancy via colonization and local extinction probabilities, estimated from time series of occurrence data. Yet, tests of whether these models improve predictive accuracy under current or future conditions are rare. Using a long-term data set on 69 Swiss birds, we tested whether DOMs improve the predictions of distribution changes over time compared to SDMs. We evaluated the accuracy of spatial predictions and their ability to detect population trends. We also explored how predictions differed when we accounted for imperfect detection and parameterized models using calibration data sets of different time series lengths. All model types had high spatial predictive performance when assessed across all sites (mean AUC > 0.8), with flexible machine learning SDM algorithms outperforming parametric static and DOMs. However, none of the models performed well at identifying sites where range changes are likely to occur. In terms of estimating population trends, DOMs performed best, particularly for species with strong population changes and when fit with sufficient data, while static SDMs performed very poorly. Overall, our study highlights the importance of considering what aspects of performance matter most when selecting a modelling method for a particular application and the need for further research to improve model utility. While DOMs show promise for capturing range dynamics and inferring population trends when fitted with sufficient data, computational constraints on variable selection and model fitting can lead to reduced spatial accuracy of predictions, an area warranting more attention.
Date	SEP 2021
Language	English
Short Title	Can dynamic occupancy models improve predictions of species' range dynamics?
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2

Accessed	15/03/2023, 14:50:41
Extra	Place: Hoboken Publisher: Wiley WOS:000663380200001
Volume	27
Pages	4269-4282
Publication	Global Change Biology
DOI	10.1111/gcb.15723
Issue	18
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

climate-change, colonization, complex, curve, detection probability, estimating site occupancy, extinction risk, impacts, imperfect detection, model evaluation, multiseason occupancy models, predictive performance, rates, shifts, species distribution models, species trends

Attachments

- Full Text

CaPTrends: A database of large carnivoran population trends from around the world

Type	Journal Article
Author	Thomas F. Johnson
Author	Paula Cruz
Author	Nick J. B. Isaac
Author	Agustin Paviolo
Author	Manuela Gonzalez-Suarez

Abstract Motivation Population trend information is an 'essential biodiversity variable' for monitoring change in biodiversity over time. Here, we present a database of 1,122 population trends from around the world, describing changes in abundance over time in large mammal species (n = 50) from four families in the order Carnivora. For this subset of taxa, we provide approximately 21 times more trends than BioTIME and three times more trends than the Living Planet database. Main types of variables included Key data fields for each trend: species, coordinates, trend time-frame, methods of data collection and analysis, and population time series or summarized trend value. Population trend values are reported using quantitative metrics in 75% of records that collectively represent more than 6,500 population estimates. The remaining records qualitatively describe population change (e.g., increase). Spatial location and grain Trends represent 621 unique locations across the globe (latitude: -51.0 to 80.0; longitude: -166.0 to 166.0). Most trends (86%) are found within the Northern Hemisphere. Time period and grain On average (mean), trends are derived from 6.5 abundance observations, and span in time from 1726 to 2017, with 92% of trends starting after 1950. Major taxa and level of measurement We conducted a semi-systematic search for population trend data in 87 species from four families in the order Carnivora: Canidae, Felidae, Hyaenidae and Ursidae. We compiled data for 50 of the 87 species. Software format .csv.

Date DEC 2022
Language English
Short Title CaPTrends
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:17
Extra Place: Hoboken Publisher: Wiley WOS:000850771300001
Volume 31
Pages 2475-2482
Publication Global Ecology and Biogeography
DOI 10.1111/geb.13587
Issue 12
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

abundance, BioTIME, carnivorans, density, essential biodiversity variable, Living Planet database, population trend, predator

Attachments

- Accepted Version

Caribou exclusion during a population low increases deciduous and evergreen shrub species biomass and nitrogen pools in low Arctic tundra

Type Journal Article
Author Tara J. Zamin
Author Paul Grogan
Abstract Increased shrub growth has been observed across the Arctic with recent climate warming trends, whilst many populations of caribou and reindeer (Rangifer) have been in decline. Paradoxically, our current understanding of the impacts of caribou and reindeer in altering trajectories of Arctic vegetation change is almost entirely dependent on studies with relatively high density semi-domesticated herds in Fennoscandia. With many wild herd populations across the Arctic presently at much lower densities, it is important to understand the impact of low intensity browsing on shrub biomass and the soil nutrient pools that fuel it. We used exclosures that have been in place for 5years in mesic birch hummock tundra in the central Canadian low Arctic to investigate the impact of caribou exclusion on tundra shrub biomass, tissue chemistry and plant and soil nitrogen (N) pools. Over the study period, the migratory tundra caribou herd in the region declined from 25% to 7% of its previous population maximum. Caribou exclusion significantly enhanced the above-ground biomass components of one deciduous shrub (Betula glandulosa) and two evergreen shrubs (Vaccinium vitis-idaea and Rhododendron subarcticum). In particular, exclusion doubled B.glandulosa leaf biomass and increased V.vitis-idaea old leaf biomass 1.7 times, with the strongest effects in evergreens present in tissues

> 1year old, indicating a legacy of browsing from the earlier years of the experiment when the caribou population was higher. Meanwhile, Vaccinium uliginosum biomass and overall vascular plant diversity tended to decline with exclusion. Caribou exclusion increased B.glandulosa leaf N pools by 0.15gNm2 (equivalent to 12% of the total vascular plant community annual N requirement for apical growth). Altogether exclusion did not alter total above-ground N pools, but rather led to a redistribution of shoot biomass and N, enhancing spatial variability in a key growth-limiting resource for tundra plants. Synthesis. Excluding caribou during a population low resulted in ecologically significant changes in the distribution of plant above-ground biomass and nitrogen, further increasing the dominance of the three most abundant shrubs. These findings demonstrate that, despite uncertainty in herd recovery, Rangifer browsing impacts to both deciduous and evergreen shrub species should be considered for more robust projections of Arctic vegetation change.

Date	MAY 2013
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:28:28
Extra	Place: Hoboken Publisher: Wiley WOS:000318186800013
Volume	101
Pages	671-683
Publication	Journal of Ecology
DOI	10.1111/1365-2745.12082
Issue	3
Journal Abbr	J. Ecol.
ISSN	0022-0477
Date Added	15/03/2023, 14:28:28
Modified	15/03/2023, 14:28:28

Tags:

alaskan tundra, arctic tundra, caribou, climate-change, community structure, determinants of plant community diversity and structure, growth form, herbivory, nitrogen pool, nutrient, phenolics, plant-responses, productivity, rangifer-tarandus, reindeer, shrub expansion, term, vegetation

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Causes and consequences of spatial variation in sex ratios in a declining bird species

Type	Journal Article
Author	Catriona A. Morrison
Author	Robert A. Robinson
Author	Jacquie A. Clark
Author	Jennifer A. Gill

Abstract 1. Male-biased sex ratios occur in many bird species, particularly in those with small or declining populations, but the causes of these skews and their consequences for local population demography are rarely known. Within-species variation in sex ratios can help to identify the demographic and behavioural processes associated with such biases. 2. Small populations may be more likely to have skewed sex ratios if sex differences in survival, recruitment or dispersal vary with local abundance. Analyses of species with highly variable local abundances can help to identify these mechanisms and the implications for spatial variation in demography. Many migratory bird species are currently undergoing rapid and severe declines in abundance in parts of their breeding ranges and thus have sufficient spatial variation in abundance to explore the extent of sex ratio biases, their causes and implications. 3. Using national-scale bird ringing data for one such species (willow warbler, Phylloscopus trochilus), we show that sex ratios vary greatly across Britain and that male-biased sites are more frequent in areas of low abundance, which are now widespread across much of south and east England. These sex ratio biases are sufficient to impact local productivity, as the relative number of juveniles caught at survey sites declines significantly with increasing sex ratio skew. 4. Sex differences in survival could influence this sex ratio variation, but we find little evidence for sex differences in survival increasing with sex ratio skew. In addition, sex ratios have become male-biased over the last two decades, but there are no such trends in adult survival rates for males or females. This suggests that lower female recruitment into low abundance sites is contributing to these skews. 5. These findings suggest that male-biased sex ratios in small and declining populations can arise through local-scale sex differences in survival and dispersal, with females recruiting disproportionately into larger populations. Given the high level of spatial variation in population declines and abundance of many migratory bird species across Europe at present, male-biased small populations may be increasingly common. As singing males are the primary records used in surveys of these species, and as unpaired males often sing throughout the breeding season, local sex ratio biases could also be masking the true extent of these population declines.

Date	SEP 2016
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:27:06
Extra	Place: Hoboken Publisher: Wiley WOS:000388353400017
Volume	85
Pages	1298-1306
Publication	Journal of Animal Ecology
DOI	10.1111/1365-2656.12556
Issue	5
Journal Abbr	J. Anim. Ecol.
ISSN	0021-8790
Date Added	15/03/2023, 14:27:14
Modified	15/03/2023, 14:27:14

Tags:

abundance, attraction, biased dispersal, demography, detectability, dominance, fitness consequences, migration, population declines, population dynamics, predation, productivity, sex ratio, willow warbler

Attachments

- Full Text

Challenges and opportunities for using natural history collections to estimate insect population trends

Type Journal Article
Author Courtney L. Davis
Author Robert P. Guralnick
Author Elise F. Zipkin
Abstract Natural history collections (NHC) provide a wealth of information that can be used to understand the impacts of global change on biodiversity. As such, there is growing interest in using NHC data to estimate changes in species' distributions and abundance trends over historic time horizons when contemporary survey data are limited or unavailable. However, museum specimens were not collected with the purpose of estimating population trends and thus can exhibit spatiotemporal and collector-specific biases that can impose severe limitations to using NHC data for evaluating population trajectories. Here we review the challenges associated with using museum records to track long-term insect population trends, including spatiotemporal biases in sampling effort and sparse temporal coverage within and across years. We highlight recent methodological advancements that aim to overcome these challenges and discuss emerging research opportunities. Specifically, we examine the potential of integrating museum records and other contemporary data sources (e.g. collected via structured, designed surveys and opportunistic citizen science programs) in a unified analytical framework that accounts for the sampling biases associated with each data source. The emerging field of integrated modelling provides a promising framework for leveraging the wealth of collections data to accurately estimate long-term trends of insect populations and identify cases where that is not possible using existing data sources.
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:56
Extra Place: Hoboken Publisher: Wiley WOS:000816750500001
Publication Journal of Animal Ecology
DOI 10.1111/1365-2656.13763
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

abundance, bias, butterflies, citizen science, climate, data integration, decline, insights, monarch butterflies, museum collections, museum records, phenological change, population trends, provide

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Changes in climate drive recent monarch butterfly dynamics

Type Journal Article
Author Erin R. Zylstra
Author Leslie Ries

Author Naresh Neupane
Author Sarah P. Saunders
Author M. Isabel Ramirez
Author Eduardo Rendon-Salinas
Author Karen S. Oberhauser
Author Matthew T. Farr
Author Elise F. Zipkin

Abstract Declines in the abundance and diversity of insects pose a substantial threat to terrestrial ecosystems worldwide. Yet, identifying the causes of these declines has proved difficult, even for well-studied species like monarch butterflies, whose eastern North American population has decreased markedly over the last three decades. Three hypotheses have been proposed to explain the changes observed in the eastern monarch population: loss of milkweed host plants from increased herbicide use, mortality during autumn migration and/or early-winter resettlement and changes in breeding-season climate. Here, we use a hierarchical modelling approach, combining data from >18,000 systematic surveys to evaluate support for each of these hypotheses over a 25-yr period. Between 2004 and 2018, breeding-season weather was nearly seven times more important than other factors in explaining variation in summer population size, which was positively associated with the size of the subsequent overwintering population. Although data limitations prevent definitive evaluation of the factors governing population size between 1994 and 2003 (the period of the steepest monarch decline coinciding with a widespread increase in herbicide use), breeding-season weather was similarly identified as an important driver of monarch population size. If observed changes in spring and summer climate continue, portions of the current breeding range may become inhospitable for monarchs. Our results highlight the increasingly important contribution of a changing climate to insect declines. A collation of data on North American monarch butterfly summer breeding and overwintering populations from 1994 to 2018, combined with seasonal covariate data, suggests an increasing role of climate change as a driver of butterfly dynamics.

Date OCT 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:27:54
Extra Place: Berlin Publisher: Nature Portfolio WOS:000674527000005
Volume 5
Pages 1441-+
Publication Nature Ecology & Evolution
DOI 10.1038/s41559-021-01504-1
Issue 10
Journal Abbr Nat. Ecol. Evol.
ISSN 2397-334X
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

abundance, biosphere reserve, declines, land-cover, lepidoptera, mexico, migration, temperature, terrestrial, trends

Changes in species interactions across a 2.5 km elevation gradient: effects on plant migration in response to climate change

Type Journal Article

Author Rachel Hillyer

Author Miles R. Silman

Abstract Predicted climate change in the Andes will require plant species to migrate upslope to avoid extinction. Central to predictions of species responses to climate change is an understanding of species distributions along environmental gradients. Environmental gradients are frequently modelled as abiotic, but biotic interactions can play important roles in setting species distributions, abundances, and life history traits. Biotic interactions also have the potential to influence species responses to climate change, yet they remain mostly unquantified. An important interaction long studied in tropical forests is postdispersal seed predation which has been shown to affect the population dynamics, community structure, and diversity of plant species in time and space. This paper presents a comparative seed predation study of 24 species of tropical trees across a 2.5 km elevation gradient in the Peruvian Andes and quantifies seed predation variation across the elevational gradient. We then use demographic modelling to assess effects of the observed variation in seed predation on population growth rates in response to observed increasing temperatures in the area. We found marked variation among species in total seed predation depending on the major seed predator of the species and consistent changes in seed predation across the gradient. There was a significant increase in seed survival with increasing elevation, a trend that appears to be driven by regulation of seed predators via top-down forces in the lowlands giving way to bottom-up (productivity) regulation at mid- to high elevations, resulting in a ninefold increase in effective fecundity for trees at high elevations. This potential increase in seed crop size strongly affects modelled plant population growth and seed dispersal distances, increasing population migration potential in the face of climate change. These results also indicate that species interactions can have effects on par with climate in species responses to global change.

Date DEC 2010

Language English

Short Title Changes in species interactions across a 2.5 km elevation gradient

Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2

Accessed 15/03/2023, 14:51:19

Extra Place: Hoboken Publisher: Wiley WOS:000283726600004

Volume 16

Pages 3205-3214

Publication Global Change Biology

DOI 10.1111/j.1365-2486.2010.02268.x

Issue 12

Journal Abbr Glob. Change Biol.

ISSN 1354-1013

Date Added 15/03/2023, 14:51:19

Modified 15/03/2023, 14:51:19

Tags:

Andes, climate change, demography, dipteryx-panamensis, dispersal, dynamics, extinction risk, life table response experiment, postdispersal seed predation, recruitment, rodents, seed dispersal, seed predation, size, species interactions, species migration, tree, tropical rain-forests

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Changing gull diet in a changing world: A 150-year stable isotope (delta C-13, delta N-15) record from feathers collected in the Pacific Northwest of North America

Type	Journal Article
Author	Louise K. Blight
Author	Keith A. Hobson
Author	T. Kurt Kyser
Author	Peter Arcese
Abstract	The world's oceans have undergone significant ecological changes following European colonial expansion and associated industrialization. Seabirds are useful indicators of marine food web structure and can be used to track multidecadal environmental change, potentially reflecting long-term human impacts. We used stable isotope (C-13, N-15) analysis of feathers from glaucous-winged gulls (Larus glaucescens) in a heavily disturbed region of the northeast Pacific to ask whether diets of this generalist forager changed in response to shifts in food availability over 150years, and whether any detected change might explain long-term trends in gull abundance. Sampled feathers came from birds collected between 1860 and 2009 at nesting colonies in the Salish Sea, a transboundary marine system adjacent to Washington, USA and British Columbia, Canada. To determine whether temporal trends in stable isotope ratios might simply reflect changes to baseline environmental values, we also analysed muscle tissue from forage fishes collected in the same region over a multidecadal timeframe. Values of C-13 and N-15 declined since 1860 in both subadult and adult gulls (C-13, similar to 2-6 parts per thousand; N-15, similar to 4-5 parts per thousand), indicating that their diet has become less marine over time, and that birds now feed at a lower trophic level than previously. Conversely, forage fish C-13 and N-15 values showed no trends, supporting our conclusion that gull feather values were indicative of declines in marine food availability rather than of baseline environmental change. Gradual declines in feather isotope values are consistent with trends predicted had gulls consumed less fish over time, but were equivocal with respect to whether gulls had switched to a more garbage-based diet, or one comprising marine invertebrates. Nevertheless, our results suggest a long-term decrease in diet quality linked to declining fish abundance or other anthropogenic influences, and may help to explain regional population declines in this species and other piscivores.
Date	APR 2015
Language	English
Short Title	Changing gull diet in a changing world
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed	15/03/2023, 14:47:08
Extra	Place: Hoboken Publisher: Wiley WOS:000351214100013
Volume	21

Pages 1497-1507
Publication Global Change Biology
DOI 10.1111/gcb.12796
Issue 4
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

black-backed gulls, carbon-13, environmental change, feeding-behavior, food availability, forage fish, glaucous-winged gull, glaucous-winged gulls, indicator species, larus glaucescens, larus-argentatus, nitrogen-15, population-dynamics, preservation, reproductive output, Salish Sea, sea, seabird, shifting baselines, stable isotope

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Changing recruitment capacity in global fish stocks

Type Journal Article

Author Gregory L. Britten
Author Michael Dowd
Author Boris Worm

Abstract Marine fish and invertebrates are shifting their regional and global distributions in response to climate change, but it is unclear whether their productivity is being affected as well. Here we tested for time-varying trends in biological productivity parameters across 262 fish stocks of 127 species in 39 large marine ecosystems and high-seas areas (hereafter LMEs). This global meta-analysis revealed widespread changes in the relationship between spawning stock size and the production of juvenile offspring (recruitment), suggesting fundamental biological change in fish stock productivity at early life stages. Across regions, we estimate that average recruitment capacity has declined at a rate approximately equal to 3% of the historical maximum per decade. However, we observed large variability among stocks and regions; for example, highly negative trends in the North Atlantic contrast with more neutral patterns in the North Pacific. The extent of biological change in each LME was significantly related to observed changes in phytoplankton chlorophyll concentration and the intensity of historical overfishing in that ecosystem. We conclude that both environmental changes and chronic overfishing have already affected the productive capacity of many stocks at the recruitment stage of the life cycle. These results provide a baseline for ecosystem-based fisheries management and may help adjust expectations for future food production from the oceans.

Date JAN 5 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:10
Extra Place: Washington Publisher: Natl Acad Sciences WOS:000367520400045
Volume 113

Pages 134-139
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.1504709112
Issue 1
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

density-dependence, fisheries, fluctuations, maximum reproductive rate, nonstationary processes, ocean, population dynamics, productivity, recruitment, trends

Attachments

- Full Text

Circumpolar arctic tundra biomass and productivity dynamics in response to projected climate change and herbivory

Type Journal Article
Author Qin Yu
Author Howard Epstein
Author Ryan Engstrom
Author Donald Walker
Abstract Satellite remote sensing data have indicated a general 'greening' trend in the arctic tundra biome. However, the observed changes based on remote sensing are the result of multiple environmental drivers, and the effects of individual controls such as warming, herbivory, and other disturbances on changes in vegetation biomass, community structure, and ecosystem function remain unclear. We apply ArcVeg, an arctic tundra vegetation dynamics model, to estimate potential changes in vegetation biomass and net primary production (NPP) at the plant community and functional type levels. ArcVeg is driven by soil nitrogen output from the Terrestrial Ecosystem Model, existing densities of Rangifer populations, and projected summer temperature changes by the NCAR CCSM4.0 general circulation model across the Arctic. We quantified the changes in aboveground biomass and NPP resulting from (i) observed herbivory only; (ii) projected climate change only; and (iii) coupled effects of projected climate change and herbivory. We evaluated model outputs of the absolute and relative differences in biomass and NPP by country, bioclimate subzone, and floristic province. Estimated potential biomass increases resulting from temperature increase only are approximately 5% greater than the biomass modeled due to coupled warming and herbivory. Such potential increases are greater in areas currently occupied by large or dense Rangifer herds such as the Nenets-occupied regions in Russia (27% greater vegetation increase without herbivores). In addition, herbivory modulates shifts in plant community structure caused by warming. Plant functional types such as shrubs and mosses were affected to a greater degree than other functional types by either warming or herbivory or coupled effects of the two.
Date SEP 2017
Language English
Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:39
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Volume 23
Pages 3895-3907
Publication Global Change Biology
DOI 10.1111/gcb.13632
Issue 9
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:52:53
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Tags:

arctic tundra, climate change, ecosystems, herbivory, modeling carbon responses, net primary productivity, northern alaska, plant community responses, reindeer, satellite data, sea-ice, shrub expansion, tall shrub, tundra greening, vegetation, vegetation dynamics modeling, vegetation biomass

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Climate and land-use changes interact to drive long-term reorganization of riverine fish communities globally

Type Journal Article
Author Lise Comte
Author Julian D. Olden
Author Pablo A. Tedesco
Author Albert Ruhi
Author Xingli Giam
Abstract As climate change unfolds, changes in population dynamics and species distribution ranges are expected to fundamentally reshuffle communities worldwide. Yet, a comprehensive understanding of the mechanisms and extent of community reorganization remains elusive. This is particularly true in riverine systems, which are simultaneously exposed to changing temperature and streamflow, and where land-use change continues to be a major driver of biodiversity loss. Here, we use the most comprehensive compilation of fish abundance time series to date to provide a global synthesis of climate- and LU-induced effects on riverine biota with respect to changes in species thermal and streamflow affinities. We demonstrate that fish communities are increasingly dominated by thermophilic (warm-water) and limnophilic (slow-water) species. Despite being consistent with trends in water temperature and streamflow observed over recent decades, these community changes appear largely decoupled from each other and show wide spatial variation. We further reveal a synergy among climate- and land use-related drivers, such that community thermophilization is heightened in more human-modified systems. Importantly, communities in which species experience thermal and flow regimes that approach or exceed their tolerance thresholds (high community sensitivity), as well as species-poor communities (low community resilience), also display faster rates of compositional change. This research illustrates that quantifying vulnerability of riverine systems to climate change requires a broadening from a narrower thermal focus to more integrative approaches that account for the spatially varying and

multifaceted sensitivity of riverine organisms to the interactive effects of water temperature, hydrology, and other anthropogenic changes.

Date JUL 6 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:27
Extra Place: Washington Publisher: Natl Acad Sciences WOS:000685026600007
Volume 118
Pages e2011639118
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.2011639118
Issue 27
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
Date Added 15/03/2023, 14:29:40
Modified 15/03/2023, 14:29:40

Tags:

biodiversity, climate vulnerability, community flow index, community temperature index, fragmentation, freshwater ecosystems, habitat, impacts, responses, river fragmentation, vulnerability, worlds fresh-water

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Climate change accelerates local disease extinction rates in a long-term wild host-pathogen association

Type Journal Article
Author Jiasui Zhan
Author Lars Ericson
Author Jeremy J. Burdon
Abstract Pathogens are a significant component of all plant communities. In recent years, the potential for existing and emerging pathogens of agricultural crops to cause increased yield losses as a consequence of changing climatic patterns has raised considerable concern. In contrast, the response of naturally occurring, endemic pathogens to a warming climate has received little attention. Here, we report on the impact of a signature variable of global climate change - increasing temperature - on the long-term epidemiology of a natural host-pathogen association involving the rust pathogen Triphragmium ulmariae and its host plant Filipendula ulmaria. In a host-pathogen metapopulation involving approximately 230 host populations growing on an archipelago of islands in the Gulf of Bothnia we assessed changes in host population size and pathogen epidemiological measures over a 25-year period. We show how the incidence of disease and its severity declines over that period and most importantly demonstrate a positive association between a long-term trend of increasing extinction rates in individual pathogen populations of the metapopulation and increasing temperature. Our results are highly suggestive that changing climatic patterns, particularly mean monthly growing season (April-November) temperature, are markedly influencing the epidemiology of plant disease in this host-pathogen association. Given the important role plant pathogens have in shaping the structure of communities, changes in the epidemiology of pathogens have potentially far-

reaching impacts on ecological and evolutionary processes. For these reasons, it is essential to increase understanding of pathogen epidemiology, its response to warming, and to invoke these responses in forecasts for the future.

Date	AUG 2018
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:09
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Volume	24
Pages	3526-3536
Publication	Global Change Biology
DOI	10.1111/gcb.14111
Issue	8
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

adaptation, climate change, community, epidemiologic patterns, epidemiology, extinction, Filipendula ulmaria, filipendula-ulmaria, longitudinal study, metapopulation, migration, plant-pathogen, rust, snow cover, spatial effects, temperature, tree line, Triphragmium ulmariae, triphragmium-ulmariae

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Climate change alters elevational phenology patterns of the European spruce bark beetle (Ips typographus)

Type	Journal Article
Author	Oliver Jakoby
Author	Heike Lischke
Author	Beat Wermelinger
Abstract	The European spruce bark beetle Ips typographus is the most important insect pest in Central European forests. Under climate change, its phenology is presumed to be changing and mass infestations becoming more likely. While several studies have investigated climate effects across a latitudinal gradient, it remains an open question how phenology will change depending on elevation and topology. Knowing how an altered climate is likely to affect bark beetle populations, particularly across diverse topographies and elevations, is essential for adaptive management. We developed a time-varying distributed delay model to predict the phenology of I. typographus. This approach has the particular advantage of capturing the variability within populations and thus representing its stage structure at any time. The model is applied for three regional climate change scenarios, A1B, A2 and RCP3PD, to the diverse topography of Switzerland, covering a large range of elevations, aspects and slopes. We found a strong negative relationship between voltinism and elevation. Under climate change, the model predicts an increasing number of generations over the whole elevational gradient, which will be more pronounced at low elevations. In contrast, the pre-shift in spring swarming is expected to be greater at higher

elevations. In comparison, the general trend of faster beetle development on steep southern slopes is only of minor importance. Overall, the maximum elevation allowing a complete yearly generation will move upwards. Generally, the predicted increase in number of generations, earlier spring swarming, more aggregated swarming, together with a projected increase in drought and storm events, will result in a higher risk of mass infestations. This will increase the pressure on spruce stands particularly in the lowlands and require intensified management efforts. It calls for adapted long-term silvicultural strategies to mitigate the loss of ecosystem services such as timber production protection against rockfall and avalanches and carbon storage.

Date	DEC 2019
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:40
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Volume	25
Pages	4048-4063
Publication	Global Change Biology
DOI	10.1111/gcb.14766
Issue	12
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:52:53
Modified	15/03/2023, 14:52:53

Tags:

coleoptera, forest disturbance, forest pest, impact, infestation risk, l col, l., model, norway spruce, Norway spruce (Picea abies), phenology, pine processionary moth, population-dynamics, temperature, temperature-dependent development, time-varying distributed delay model, voltinism

Attachments

- Accepted Version

Climate change alters the reproductive phenology and investment of a lacustrine fish, the three-spine stickleback

Type	Journal Article
Author	Rachel A. Hovel
Author	Stephanie M. Carlson
Author	Thomas P. Quinn
Abstract	High-latitude lakes are particularly sensitive to the effects of global climate change, demonstrating earlier ice breakup, longer ice-free seasons, and increased water temperatures. Such physical changes have implications for diverse life-history traits in taxa across entire lake food webs. Here, we use a five-decade time series from an Alaskan lake to explore effects of climate change on growth and reproduction of a

widely distributed lacustrine fish, the three-spine stickleback (Gasterosteus aculeatus). We used multivariate autoregressive state-space (MARSS) models to describe trends in the mean length for multiple size classes and to explore the influence of physical (date of ice breakup, surface water temperature) and biological (density of con-and heterospecifics) factors. As predicted, mean size of age 1 and older fish at the end of the growing season increased across years with earlier ice breakup and warmer temperatures. In contrast, mean size of age 0 fish decreased over time. Overall, lower fish density and warmer water temperatures were associated with larger size for all cohorts. Earlier ice breakup was associated with larger size for age 1 and older fish but, paradoxically, with smaller size of age 0 fish. To explore this latter result, we used mixing models on age 0 size distributions, which revealed an additional cohort in years with early ice breakup, lowering the mean size of age 0 fish. Moreover, early ice breakup was associated with earlier breeding, evidenced by earlier capture of age 0 fish. Our results suggest that early ice breakup altered both timing and frequency of breeding; three-spine stickleback spawned earlier and more often in response to earlier ice breakup date. While previous studies have shown the influence of changing conditions in northern lakes on breeding timing and growth, this is the first to document increased breeding frequency, highlighting another pathway by which climate change can alter the ecology of northern lakes.

Date JUN 2017
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:51:10
Extra Place: Hoboken Publisher: Wiley WOS:000400445900016
Volume 23
Pages 2308-2320
Publication Global Change Biology
DOI 10.1111/gcb.13531
Issue 6
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Modified 15/03/2023, 14:51:19

Tags:

bioenergetics model, boreal lake, climate change, fresh-water, gasterosteus-aculeatus, growth, ice breakup, juvenile sockeye-salmon, lacustrine fish, lake baikal, mortality, oncorhynchus-nerka, phenology, population, reproduction, responses, size, three-spine stickleback, water temperature

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Climate change alters the trophic niche of a declining apex marine predator

Type Journal Article

Author Alexander L. Bond
Author Jennifer L. Lavers

Abstract Changes in the world's oceans have altered nutrient flow, and affected the viability of predator populations when prey species become unavailable. These changes are integrated into the tissues of apex predators over space and time and can be quantified using stable isotopes in the inert feathers of historical and contemporary avian specimens. We measured delta C-13 and delta N-15 values in Flesh-footed Shearwaters (Puffinus carneipes) from Western and South Australia from 1936-2011. The Flesh-footed Shearwaters more than doubled their trophic niche (from 3.91 +/- 1.37 parts per thousand(2) to 10.00 +/- 1.79 parts per thousand(2)), and dropped an entire trophic level in 75 years (predicted delta N-15 decreased from +16.9 parts per thousand to + 13.5 parts per thousand, and d 13 C from -16.9 parts per thousand to -17.9 parts per thousand) - the largest change in delta N-15 yet reported in any marine bird, suggesting a relatively rapid shift in the composition of the Indian Ocean food web, or changes in baseline delta C-13 and delta N-15 values. A stronger El Nino-Southern Oscillation results in a weaker Leeuwin Current in Western Australia, and decreased Flesh-footed Shearwater delta C-13 and delta N-15. Current climate forecasts predict this trend to continue, leading to increased oceanic 'tropicalization' and potentially competition between Flesh-footed Shearwaters and more tropical sympatric species with expanding ranges. Flesh-footed Shearwater populations are declining, and current conservation measures aimed primarily at bycatch mitigation are not restoring populations. Widespread shifts in foraging, as shown here, may explain some of the reported decline. An improved understanding and ability to mitigate the impacts of global climactic changes is therefore critical to the long-term sustainability of this declining species.

Date JUL 2014
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:38
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Volume 20
Pages 2100-2107
Publication Global Change Biology
DOI 10.1111/gcb.12554
Issue 7
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Modified 15/03/2023, 14:52:53

Tags:

anthropogenic co2, atlantic puffin, bering-sea, El Nino-Southern Oscillation, flesh-footed shearwater, leeuwin current, Leeuwin Current, niche width, nino southern-oscillation, population-dynamics, Puffinus carneipes, reproductive-performance, shearwaters puffinus-carneipes, stable isotopes, stable-isotopes, western-australia

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Climate change and commercial fishing practices codetermine survival of a long-lived seabird

Type Journal Article

Author Daniel Gibson
Author Thomas Riecke
Author Daniel H. Catlin
Author Kelsi L. Hunt
Author Chelsea E. Weithman
Author David N. Koons
Author Sarah M. Karpanty
Author James D. Fraser

Abstract Understanding the environmental mechanisms that govern population change is a fundamental objective in ecology. Although the determination of how top-down and bottom-up drivers affect demography is important, it is often equally critical to understand the extent to which, environmental conditions that underpin these drivers fluctuate across time. For example, associations between climate and both food availability and predation risk may suggest the presence of trophic interactions that may influence inferences made from patterns in ecological data. Analytical tools have been developed to account for these correlations, while providing opportunities to ask novel questions regarding how populations change across space and time. Here, we combine two modeling disciplines-path analysis and mark-recapture-recovery models-to explore whether shifts in sea-surface temperatures (SSTs) influenced top-down (entanglement in fishing equipment) or bottom-up (forage fish production) population constraints over 60 years, and the extent to which these covarying processes shaped the survival of a long-lived seabird, the Royal tern. We found that hemispheric trends in SST were associated with variation in the amount of fish harvested along the Atlantic coast of North America and in the Caribbean, whereas reductions in forage fish production were mostly driven by shifts in the amount of fish harvested by commercial fisheries throughout the North Atlantic the year prior. Although the indirect (i.e., stock depletion) and direct (i.e., entanglement) impacts of commercial fishing on Royal tern mortality has declined over the last 60 years, increased SSTs during this time period has resulted in a comparable increase in mortality risk, which disproportionately impacted the survival of the youngest age-classes of Royal terns. Given climate projections for the North Atlantic, our results indicate that threats to Royal tern population persistence in the Mid-Atlantic will most likely be driven by failures to recruit juveniles into the breeding population.

Date JAN 2023
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:50:45
Extra Place: Hoboken Publisher: Wiley WOS:000871003000001
Volume 29
Pages 324-340
Publication Global Change Biology
DOI 10.1111/gcb.16482
Issue 2
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:51:19
Modified 15/03/2023, 14:51:19

Tags:

bottom-up, capture-recapture, diet, ecological networks, extinction risk, forage fish, hierarchical models, history, royal tern, sea-surface temperature, sterna-maxima, tern thalasseus-maximus, Thalasseus maximus, top-down, top-down and bottom-up population regulation

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Climate change and shrinking salamanders: alternative mechanisms for changes in plethodontid salamander body size

Type	Journal Article
Author	Grant M. Connette
Author	John A. Crawford
Author	William E. Peterman
Abstract	An increasing number of studies have demonstrated relationships between climate trends and body size change of organisms. In many cases, climate might be expected to influence body size by altering thermoregulation, energetics or food availability. However, observed body size change can result from a variety of ecological processes (e.g. growth, selection, population dynamics) or imperfect observation of biological systems. We used two extensive datasets to evaluate alternative mechanisms for recently reported changes in the observed body size of plethodontid salamanders. We found that mean adult body size of salamanders can be highly sensitive to survey conditions, particularly rainfall. This systematic bias in the detection of larger or smaller individuals could result in a signature of body size change in relation to reported climate trends when it is simply observation error. We also identify considerable variability in body size distributions among years and find that individual growth rates can be strongly influenced by weather. Finally, our study demonstrates that measures of mean adult body size can be highly variable among surveys and that large sample sizes may be required to make reliable inferences. Identifying the effects of climate change is a critical area of research in ecology and conservation. Researchers should be aware that observed changes in certain organisms can result from multiple ecological processes or systematic bias due to nonrandom sampling of populations.
Date	AUG 2015
Language	English
Short Title	Climate change and shrinking salamanders
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:50:54
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Volume	21
Pages	2834-2843
Publication	Global Change Biology
DOI	10.1111/gcb.12883
Issue	8
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

amphibian, declines, density, detection probability, detection probability parameters, distributions, ecology, estimating site occupancy, growth, models, physiology, population dynamics, range, sampling bias, shifts, water, weather

Attachments

- Submitted Version

Climate change and squid range expansion in the North Sea

Type	Journal Article
Author	Jeroen van der Kooij
Author	Georg H. Engelhard
Author	David A. Righton
Abstract	Aim Studies focussing on long-term changes in squid populations are rare due to limited availability of fisheries-independent data. However, squid play an important role as predator and prey in marine food-webs and have also become an increasingly important target for fisheries. Their short life history is thought to make them particularly sensitive to changes in the environment, potentially leading to strong fluctuations in population size. Here, we investigate whether squid have increased in the North Sea, in terms of distribution and abundance, and whether these patterns are related to variability in environmental and climatic factors. Location North Sea, north-east Atlantic Ocean. Methods We extracted squid catches from a unique 35-year time series of bottom trawl survey data in the North Sea (1980-2014), collected during late summer (August-September). Changes in distribution and abundance were compared with climatic variables known to be linked with various ecosystem components in the area. Results We found that squid distribution across the North Sea increased over the 35-year time series. Loligo expanded southward from a predominantly north-easterly distribution, compared to northward expansions by Alloteuthis and the Ommastrephidae from their core distributions in the southern and central North Sea respectively. In addition, all squid species studied here displayed an overall increase in biomass over the time series and there were large annual fluctuations. Significantly positive relationships were found between this increase and climate variables for each of the dominant individual taxa studied and when all species were combined. Main conclusions The results suggest a strong causal relationship between climate variability, notably warming sea temperatures, and squid populations. At least for the last 35 years, climate change appears to have been largely favourable for squid and with changes in climate set to continue, squid may end up beneficiaries where many finfish struggle.
Date	NOV 2016
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:28:23
Extra	Place: Hoboken Publisher: Wiley-Blackwell WOS:000388868700017
Volume	43
Pages	2285-2298
Publication	Journal of Biogeography

DOI 10.1111/jbi.12847
Issue 11
Journal Abbr J. Biogeogr.
ISSN 0305-0270
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

abundance, additive-models, Alloteuthis, Atlantic multidecadal oscillation, atlantic oscillation, climate change, european seas, Loligo, loligo-forbesi, marine fishes, North Atlantic oscillation, North Sea, Ommastrephidae, pelagic fish, scottish waters, sea surface temperature, time series, Todaropsis, trends, variability

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Climate change in our backyards: the reshuffling of North America's winter bird communities

Type Journal Article
Author Karine Prince
Author Benjamin Zuckerberg
Abstract Much of the recent changes in North American climate have occurred during the winter months, and as result, overwintering birds represent important sentinels of anthropogenic climate change. While there is mounting evidence that bird populations are responding to a warming climate (e.g., poleward shifts) questions remain as to whether these species-specific responses are resulting in community-wide changes. Here, we test the hypothesis that a changing winter climate should favor the formation of winter bird communities dominated by warm-adapted species. To do this, we quantified changes in community composition using a functional index - the Community Temperature Index (CTI) - which measures the balance between low- and high-temperature dwelling species in a community. Using data from Project FeederWatch, an international citizen science program, we quantified spatiotemporal changes in winter bird communities (n=38 bird species) across eastern North America and tested the influence of changes in winter minimum temperature over a 22-year period. We implemented a jackknife analysis to identify those species most influential in driving changes at the community level and the population dynamics (e.g., extinction or colonization) responsible for these community changes. Since 1990, we found that the winter bird community structure has changed with communities increasingly composed of warm-adapted species. This reshuffling of winter bird communities was strongest in southerly latitudes and driven primarily by local increases in abundance and regional patterns of colonization by southerly birds. CTI tracked patterns of changing winter temperature at different temporal scales ranging from 1 to 35years. We conclude that a shifting winter climate has provided an opportunity for smaller, southerly distributed species to colonize new regions and promote the formation of unique winter bird assemblages throughout eastern North America.
Date FEB 2015
Language English
Short Title Climate change in our backyards
Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:26
Extra Place: Hoboken Publisher: Wiley WOS:000348652400007
Volume 21
Pages 572-585
Publication Global Change Biology
DOI 10.1111/gcb.12740
Issue 2
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Modified 15/03/2023, 14:47:34

Tags:

abundance, avian ecology, change impacts, citizen science, climate change, community temperature index, constraints, distributions, poleward shifts, population, Project FeederWatch, range, snow cover, trends, warming hole, winter warming

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Climate change leads to differential shifts in the timing of annual cycle stages in a migratory bird

Type Journal Article
Author Barbara M. Tomotani
Author Henk van der Jeugd
Author Phillip Gienapp
Author Ivan de la Hera
Author Jos Pilzecker
Author Corry Teichmann
Author Marcel E. Visser
Abstract Shifts in reproductive phenology due to climate change have been well documented in many species but how, within the same species, other annual cycle stages (e.g. moult, migration) shift relative to the timing of breeding has rarely been studied. When stages shift at different rates, the interval between stages may change resulting in overlaps, and as each stage is energetically demanding, these overlaps may have negative fitness consequences. We used long-term data of a population of European pied flycatchers (Ficedula hypoleuca) to investigate phenological shifts in three annual cycle stages: spring migration (arrival dates), breeding (egg-laying and hatching dates) and the onset of postbreeding moult. We found different advancements in the timing of breeding compared with moult (moult advances faster) and no advancement in arrival dates. To understand these differential shifts, we explored which temperatures best explain the year-to-year variation in the timing of these stages, and show that they respond differently to temperature increases in the Netherlands, causing the intervals between arrival and breeding and between breeding and moult to decrease. Next, we tested the fitness consequences of these shortened intervals. We found no effect on clutch size, but the probability of a fledged chick to recruit increased with a shorter arrival-breeding interval (earlier breeding). Finally, mark-recapture analyses did not detect an effect of shortened

intervals on adult survival. Our results suggest that the advancement of breeding allows more time for fledgling development, increasing their probability to recruit. This may incur costs to other parts of the annual cycle, but, despite the shorter intervals, there was no effect on adult survival. Our results show that to fully understand the consequences of climate change, it is necessary to look carefully at different annual cycle stages, especially for organisms with complex cycles, such as migratory birds.

Date FEB 2018
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:31
Extra Place: Hoboken Publisher: Wiley WOS:000423994700051
Volume 24
Pages 823-835
Publication Global Change Biology
DOI 10.1111/gcb.14006
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Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:52:53
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Tags:

arrival-time, breeding, European pied flycatcher, evolutionary, Ficedula hypoleuca, fitness, mark-recapture, migration, minimum temperature trends, molt, moult, phenology, pied flycatchers, population-growth, recruitment, reproductive success, responses, spring migration

Attachments

- Full Text

Climate change vulnerability for species-Assessing the assessments

Type Journal Article
Author Christopher J. Wheatley
Author Colin M. Beale
Author Richard B. Bradbury
Author James W. Pearce-Higgins
Author Rob Critchlow
Author Chris D. Thomas
Abstract Climate change vulnerability assessments are commonly used to identify species at risk from global climate change, but the wide range of methodologies available makes it difficult for end users, such as conservation practitioners or policymakers, to decide which method to use as a basis for decision-making. In this study, we evaluate whether different assessments consistently assign species to the same risk categories and whether any of the existing methodologies perform well at

identifying climate-threatened species. We compare the outputs of 12 climate change vulnerability assessment methodologies, using both real and simulated species, and validate the methods using historic data for British birds and butterflies (i.e. using historical data to assign risks and more recent data for validation). Our results show that the different vulnerability assessment methods are not consistent with one another; different risk categories are assigned for both the real and simulated sets of species. Validation of the different vulnerability assessments suggests that methods incorporating historic trend data into the assessment perform best at predicting distribution trends in subsequent time periods. This study demonstrates that climate change vulnerability assessments should not be used interchangeably due to the poor overall agreement between methods when considering the same species. The results of our validation provide more support for the use of trend-based rather than purely trait-based approaches, although further validation will be required as data become available.

Date	SEP 2017
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:50:58
Extra	Place: Hoboken Publisher: Wiley WOS:000406812100023
Volume	23
Pages	3704-3715
Publication	Global Change Biology
DOI	10.1111/gcb.13759
Issue	9
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

biodiversity, bird populations, butterflies, climate change, conservation, conservation prioritization, extinction risk, framework, geographical range, kappa, models, policy, quantification, risk assessment, species conservation, threats, vulnerability assessment

Attachments

- Accepted Version

Climate drivers of seed production in Picea engelmannii and response to warming temperatures in the southern Rocky Mountains

Type	Journal Article
Author	Arne Buechling
Author	Patrick H. Martin
Author	Charles D. Canham
Author	Wayne D. Shepperd

Author Mike A. Battaglia

Abstract Seed production by Picea engelmannii was monitored at 13 sites distributed across a 670m elevation gradient for 40years. Time series of annual seed output was investigated for evidence of masting behaviour and trends in seed abundance over time. We used regression models in a likelihood framework to examine climate effects on seed production for critical periods in the species' reproductive cycle. We rigorously evaluated the performance of two gridded climate data sets, PRISM and TopoWx, before using associated variables as predictors in the seed models. Seed production at these sites does not strictly conform to the classic masting concept. Seed abundance was highly variable over time and strongly synchronized among sites, but mast years could not be objectively identified due to intermediate levels of seed output. Model results indicate that climate conditions across multiple years cumulatively determine reproductive output. High seed rain is associated with elevated summer temperatures in the year that seeds are dispersed, low spring snowfall in the year preceding seed dispersal when buds are initiated, and reduced spring snowfall in a so-called priming year two years prior to seed dispersal. Low spring precipitation putatively increases growing season length and resource accumulation in seed trees. Linear models identified significant positive trends in seed output over time. Anomalous aridity and summer warmth in the latter half of the study period were highly favourable for seed production and were associated with increases in seed abundance.Synthesis. The increases in seed output observed in this study may promote population fitness of P. engelmannii in the face of changing climate regimes and increasing frequencies of fire- and insect-related tree mortality in the Rocky Mountains. Since this species lacks a persistent seed bank, re-colonization of disturbed areas or dispersal to shifting habitats depends on adequate production of seed by surviving trees, which according to these analyses may be moderately enhanced by current climate trends. However, some evidence also indicates that increases in seed output will ultimately be constrained by threshold high temperatures in the seed maturation year.

Date JUL 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:20
Extra Place: Hoboken Publisher: Wiley WOS:000379015400017
Volume 104
Pages 1051-1062
Publication Journal of Ecology
DOI 10.1111/1365-2745.12572
Issue 4
Journal Abbr J. Ecol.
ISSN 0022-0477
Date Added 15/03/2023, 14:29:40
Modified 15/03/2023, 14:29:40

Tags:

climate change, cone production, drought, dynamics, evolutionary ecology, forest, growth, life-history trade-offs, mast, masting, maximum likelihood, patterns, precipitation, prism, reproduction, reproductive ecology, TopoWx

Climate effects on population fluctuations of the white-throated dipper Cinclus cinclus

Type	Journal Article
Author	Anna L. K. Nilsson
Author	Endre Knudsen
Author	Kurt Jerstad
Author	Ole W. Rostad
Author	Bjorn Walseng
Author	Tore Slagsvold
Author	Nils C. Stenseth
Abstract	P>1. Climate change may have profound consequences for many organisms. We have studied fluctuations in a population of the white-throated dipper Cinclus cinclus during 31 years (1978-2008) in a river system in southern Norway in relation to both large-scale and local weather conditions occurring during the non-breeding season. 2. Multiple regression and partial least squares regression were used to model the growth rate of the population, accounting for population size in the previous year. 3. Population growth was influenced by North Atlantic Oscillation (NAO), mean winter temperature, precipitation and timing of ice formation on the main lake in the river system in autumn. These variables explained 84% of the variation in population growth over the 31 -year study period. 4. Local winter conditions played a prominent role in explaining the population fluctuations, which is plausible because the dipper depends on open water for foraging. In the study area, winters can be harsh and rivers and lakes may freeze and severely affect the subsequent population size of the dipper in spring. 5. The breeding population of the dipper does not seem yet to have reached a level where all possible territories in the area have been occupied, even after mild winters, and the estimated carrying capacity is also decidedly lower (66 breeding pairs) than the number of available territories. If the trend of milder winters continues, the population might increase in the future. However, strong climate variation is expected to continue in the future, and hence periods of rapid growth of the dipper population will probably be followed by severe declines.
Date	JAN 2011
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:28:22
Extra	Place: Hoboken Publisher: Wiley WOS:000285110600023
Volume	80
Pages	235-243
Publication	Journal of Animal Ecology
DOI	10.1111/j.1365-2656.2010.01755.x
Issue	1
Journal Abbr	J. Anim. Ecol.
ISSN	0021-8790
Date Added	15/03/2023, 14:28:28
Modified	15/03/2023, 14:28:28

Tags:

birds, climatic variability, consequences, deer, density-dependence, dynamics, impacts, indexes, long-term study, model, north-atlantic oscillation, population dynamics, population ecology, scale, trends

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Climate effects on size-at-age: growth in warming waters compensates for earlier maturity in an exploited marine fish

Type	Journal Article
Author	Anna B. Neuheimer
Author	Peter Gronkjaer
Abstract	Over the past 3decades, North Sea Atlantic cod (Gadus morhua) have exhibited variable length-at-age along with declines in spawning stock biomass and timing of maturity. Multiple factors affecting growth and development in fish acted on this economically important stock over the same period including warming waters and an intensive fishery. Here, we employ North Sea cod as a model population, exploring how a physiologically relevant temperature metric (the growing degree-day, GDD; degrees Cday) can be used to compare year-classes on a physiologically relevant time-scale, disentangling influences of climate (thermal history) on observed length-at-age trends. We conclude that the trends in North Sea cod length-at-age observed during the last three decades can be explained by a combination of temperature-dependent growth increases and a trend toward earlier maturation, the latter likely induced by the intensive fishing pressure, and possibly evidence of fisheries-induced evolution.
Date	JUN 2012
Language	English
Short Title	Climate effects on size-at-age
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed	15/03/2023, 14:47:19
Extra	Place: Hoboken Publisher: Wiley WOS:000303763600004
Volume	18
Pages	1812-1822
Publication	Global Change Biology
DOI	10.1111/j.1365-2486.2012.02673.x
Issue	6
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:47:34
Modified	15/03/2023, 14:47:34

Tags:

atlantic cod, Climate, cod gadus-morhua, density-dependent growth, fish, fishing, growing degree-day, growth, haddock melanogrammus-aeglefinus, icelandic shelf, length, life-history evolution, maturation, maturation reaction norms, north-sea cod, population-dynamics, production, size, temperature

Climate warming is associated with smaller body size and shorter lifespans in moose near their southern range limit

Type Journal Article

Author Sarah R. Hoy
Author Rolf O. Peterson
Author John A. Vucetich

Abstract Despite the importance of body size for individual fitness, population dynamics and community dynamics, the influence of climate change on growth and body size is inadequately understood, particularly for long-lived vertebrates. Although temporal trends in body size have been documented, it remains unclear whether these changes represent the adverse impact of climate change (environmental stress constraining phenotypes) or its mitigation (via phenotypic plasticity or evolution). Concerns have also been raised about whether climate change is indeed the causal agent of these phenotypic shifts, given the length of time-series analysed and that studies often do not evaluate - and thereby sufficiently rule out - other potential causes. Here, we evaluate evidence for climate-related changes in adult body size (indexed by skull size) over a 4-decade period for a population of moose (Alces alces) near the southern limit of their range whilst also considering changes in density, predation, and human activities. In particular, we document: (i) a trend of increasing winter temperatures and concurrent decline in skull size (decline of 19% for males and 13% for females) and (ii) evidence of a negative relationship between skull size and winter temperatures during the first year of life. These patterns could be plausibly interpreted as an adaptive phenotypic response to climate warming given that latitudinal/temperature clines are often accepted as evidence of adaptation to local climate. However, we also observed: (iii) that moose with smaller skulls had shorter lifespans, (iv) a reduction in lifespan over the 4-decade study period, and (v) a negative relationship between lifespan and winter temperatures during the first year of life. Those observations indicate that this phenotypic change is not an adaptive response to climate change. However, this decline in lifespan was not accompanied by an obvious change in population dynamics, suggesting that climate change may affect population dynamics and life-histories differently.

Date JUN 2018
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:51:15
Extra Place: Hoboken Publisher: Wiley WOS:000433717700022
Volume 24
Pages 2488-2497
Publication Global Change Biology
DOI 10.1111/gcb.14015
Issue 6
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:51:19
Modified 15/03/2023, 14:51:19

Tags:

Alces alces, bergmanns rule, bottom-up, climate change, deer, density dependence, dynamics, early life conditions, evolutionary, growth, phenotypic change, population, predation, responses, time, top-down, winter temperatures

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Climate-associated population declines reverse recovery and threaten future of an iconic high-elevation plant

Type	Journal Article
Author	Paul D. Krushelnycky
Author	Lloyd L. Loope
Author	Thomas W. Giambelluca
Author	Forest Starr
Author	Kim Starr
Author	Donald R. Drake
Author	Andrew D. Taylor
Author	Robert H. Robichaux
Abstract	Although climate change is predicted to place mountain-top and other narrowly endemic species at severe risk of extinction, the ecological processes involved in such extinctions are still poorly resolved. In addition, much of this biodiversity loss will likely go unobserved, and therefore largely unappreciated. The Haleakala silversword is restricted to a single volcano summit in Hawaii, but is a highly charismatic giant rosette plant that is viewed by 12 million visitors annually. We link detailed local climate data to a lengthy demographic record, and combine both with a population-wide assessment of recent plant mortality and recruitment, to show that after decades of strong recovery following successful management, this iconic species has entered a period of substantial climate-associated decline. Mortality has been highest at the lower end of the distributional range, where most silverswords occur, and the strong association of annual population growth rates with patterns of precipitation suggests an increasing frequency of lethal water stress. Local climate data confirm trends toward warmer and drier conditions on the mountain, and signify a bleak outlook for silverswords if these trends continue. The silversword example foreshadows trouble for diversity in other biological hotspots, and illustrates how even well-protected and relatively abundant species may succumb to climate-induced stresses.
Date	MAR 2013
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:50:47
Extra	Place: Hoboken Publisher: Wiley WOS:000314219700022
Volume	19
Pages	911-922
Publication	Global Change Biology
DOI	10.1111/gcb.12111
Issue	3
Journal Abbr	Glob. Change Biol.

ISSN 1354-1013
Date Added 15/03/2023, 14:51:19
Modified 15/03/2023, 14:51:19

Tags:

alpine, alpine plants, Argyroxyphium sandwicense, biodiversity loss, climate change ecology, compositae, drought, hotspot, induced tree mortality, madiinae, mechanisms, population declines, shift, silversword, survival, temperature

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Climate-driven aerobic habitat loss in the California Current System

Type Journal Article

Author Evan M. Howard
Author Justin L. Penn
Author Hartmut Frenzel
Author Brad A. Seibel
Author Daniele Bianchi
Author Lionel Renault
Author Faycal Kessouri
Author Martha A. Sutula
Author James C. Mcwilliams
Author Curtis Deutsch

Abstract Climate warming is expected to intensify hypoxia in the California Current System (CCS), threatening its diverse and productive marine ecosystem. We analyzed past regional variability and future changes in the Metabolic Index (Phi), a species-specific measure of the environment's capacity to meet temperature-dependent organismal oxygen demand. Across the traits of diverse animals, Phi exhibits strong seasonal to interdecadal variations throughout the CCS, implying that resident species already experience large fluctuations in available aerobic habitat. For a key CCS species, northern anchovy, the long-term biogeographic distribution and decadal fluctuations in abundance are both highly coherent with aerobic habitat volume. Ocean warming and oxygen loss by 2100 are projected to decrease Phi below critical levels in 30 to 50% of anchovies' present range, including complete loss of aerobic habitat-and thus likely extirpation-from the southern CCS. Aerobic habitat loss will vary widely across the traits of CCS taxa, disrupting ecological interactions throughout the region.

Date MAY 2020
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:18
Extra Place: Washington Publisher: Amer Assoc Advancement Science WOS:000533573300007
Volume 6
Pages eaay3188
Publication Science Advances
DOI 10.1126/sciadv.aay3188

Issue 20
Journal Abbr Sci. Adv.
ISSN 2375-2548
Date Added 15/03/2023, 14:29:40
Modified 15/03/2023, 14:29:40

Tags:

dosidicus-gigas, engraulis-mordax, fishes, northern anchovy, oxygen limitation, populations, sardine, shifts, trends, variability

Attachments

- Full Text

Climate-related genetic variation in drought-resistance of Douglas-fir (Pseudotsuga menziesii)

Type Journal Article
Author Sheel Bansal
Author Constance A. Harrington
Author Peter J. Gould
Author J. Bradley St Clair
Abstract There is a general assumption that intraspecific populations originating from relatively arid climates will be better adapted to cope with the expected increase in drought from climate change. For ecologically and economically important species, more comprehensive, genecological studies that utilize large distributions of populations and direct measures of traits associated with drought-resistance are needed to empirically support this assumption because of the implications for the natural or assisted regeneration of species. We conducted a space-for-time substitution, common garden experiment with 35 populations of coast Douglas-fir (Pseudotsuga menziesii var. menziesii) growing at three test sites with distinct summer temperature and precipitation (referred to as cool/moist', moderate', or warm/dry') to test the hypotheses that (i) there is large genetic variation among populations and regions in traits associated with drought-resistance, (ii) the patterns of genetic variation are related to the native source-climate of each population, in particular with summer temperature and precipitation, (iii) the differences among populations and relationships with climate are stronger at the warm/dry test site owing to greater expression of drought-resistance traits (i.e., a genotypexenvironment interaction). During midsummer 2012, we measured the rate of water loss after stomatal closure (transpiration(min)), water deficit (% below turgid saturation), and specific leaf area (SLA, cm(2)g(-1)) on new growth of sapling branches. There was significant genetic variation in all plant traits, with populations originating from warmer and drier climates having greater drought-resistance (i.e., lower transpiration(min), water deficit and SLA), but these trends were most clearly expressed only at the warm/dry test site. Contrary to expectations, populations from cooler climates also had greater drought-resistance across all test sites. Multiple regression analysis indicated that Douglas-fir populations from regions with relatively cool winters and arid summers may be most adapted to cope with drought conditions that are expected in the future.
Date FEB 2015

Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:22
Extra Place: Hoboken Publisher: Wiley WOS:000348652400036
Volume 21
Pages 947-958
Publication Global Change Biology
DOI 10.1111/gcb.12719
Issue 2
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:52:53
Modified 15/03/2023, 14:52:53

Tags:

climate change, coastal, cuticular water permeability, genecology, minimum conductance, minimum transpiration, mirb. franco, photosynthesis, picea-abies, pinus-cembra, plant-responses, seed transfer, specific leaf area, stress, transpiration, water deficit

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Climatic and biotic extreme events moderate long-term responses of above- and belowground sub-Arctic heathland communities to climate change

Type Journal Article

Author Stef Bokhorst
Author Gareth K. Phoenix
Author Matty P. Berg
Author Terry V. Callaghan
Author Christopher Kirby-Lambert
Author Jarle W. Bjerke

Abstract Climate change impacts are not uniform across the Arctic region because interacting factors causes large variations in local ecosystem change. Extreme climatic events and population cycles of herbivores occur simultaneously against a background of gradual climate warming trends and can redirect ecosystem change along routes that are difficult to predict. Here, we present the results from sub-Arctic heath vegetation and its belowground micro-arthropod community in response to the two main drivers of vegetation damage in this region: extreme winter warming events and subsequent outbreaks of the defoliating autumnal moth caterpillar (Epirrita autumnata). Evergreen dwarf shrub biomass decreased (30%) following extreme winter warming events and again by moth caterpillar grazing. Deciduous shrubs that were previously exposed to an extreme winter warming event were not affected by the moth caterpillar grazing, while those that were not exposed to warming events (control plots) showed reduced (23%) biomass from grazing. Cryptogam cover increased irrespective of grazing or winter warming events. Micro-arthropods declined (46%) following winter warming but did not respond to changes in plant community. Extreme winter warming and caterpillar grazing suppressed the CO2 fluxes of the ecosystem. Evergreen dwarf shrubs are disadvantaged in a future sub-

Arctic with more stochastic climatic and biotic events. Given that summer warming may further benefit deciduous over evergreen shrubs, event and trend climate change may both act against evergreen shrubs and the ecosystem functions they provide. This is of particular concern given that Arctic heath vegetation is typically dominated by evergreen shrubs. Other components of the vegetation showed variable responses to abiotic and biotic events, and their interaction indicates that sub-Arctic vegetation response to multiple pressures is not easy to predict from single-factor responses. Therefore, while biotic and climatic events may have clear impacts, more work is needed to understand their net effect on Arctic ecosystems.

Date	NOV 2015
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:50:48
Extra	Place: Hoboken Publisher: Wiley WOS:000364777200013
Volume	21
Pages	4063-4075
Publication	Global Change Biology
DOI	10.1111/gcb.13007
Issue	11
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

boreal forest, co2 flux, cryptogam, Empetrum nigrum, empetrum-hermaphroditum, Epirrita autumnata: Herbivory, epirrita-autumnata, experimental manipulation, growth, Hylocomium splendens, Isotomiella minor, litter decomposition rates, mites, mountain birch, multiple stress, snow, springtails, tundra vegetation, winter warming events

Attachments

- Full Text

Climatic warming disrupts recurrent Alpine insect outbreaks

Type	Journal Article
Author	Derek M. Johnson
Author	Ulf Buentgen
Author	David C. Frank
Author	Kyrre Kausrud
Author	Kyle J. Haynes
Author	Andrew M. Liebhold
Author	Jan Esper
Author	Nils Chr Stenseth

Abstract Climate change has been identified as a causal factor for diverse ecological changes worldwide. Warming trends over the last couple of decades have coincided with the collapse of long-term population cycles in a broad range of taxa, although causal mechanisms are not well-understood. Larch budmoth (LBM) population dynamics across the European Alps, a classic example of regular outbreaks, inexplicably changed sometime during the 1980s after 1,200 y of nearly uninterrupted periodic outbreak cycles. Herein, analysis of perhaps the most extensive spatiotemporal dataset of population dynamics and reconstructed Alpine-wide LBM defoliation records reveals elevational shifts in LBM outbreak epicenters that coincide with temperature fluctuations over two centuries. A population model supports the hypothesis that temperature-mediated shifting of the optimal elevation for LBM population growth is the mechanism for elevational epicenter changes. Increases in the optimal elevation for population growth over the warming period of the last century to near the distributional limit of host larch likely dampened population cycles, thereby causing the collapse of a millennium-long outbreak cycle. The threshold-like change in LBM outbreak pattern highlights how interacting species with differential response rates to climate change can result in dramatic ecological changes.

Date NOV 23 2010
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:14
Extra Place: Washington Publisher: Natl Acad Sciences WOS:000284529000078
Volume 107
Pages 20576-20581
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.1010270107
Issue 47
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

abundance, elevation, european alps, impacts, larix-decidua, Lepidoptera, parasitism, parasitoids, responses, temperature, traveling wave, tree rings, tree-ring growth, tri-trophic, waves

Attachments

- Full Text

Clone history shapes Populus drought responses

Type Journal Article
Author Sherosha Raj
Author Katharina Braeutigam
Author Erin T. Hamanishi

Author Olivia Wilkins
Author Barb R. Thomas
Author William Schroeder
Author Shawn D. Mansfield
Author Aine L. Plant
Author Malcolm M. Campbell

Abstract Just as animal monozygotic twins can experience different environmental conditions by being reared apart, individual genetically identical trees of the genus Populus can also be exposed to contrasting environmental conditions by being grown in different locations. As such, clonally propagated Populus trees provide an opportunity to interrogate the impact of individual environmental history on current response to environmental stimuli. To test the hypothesis that current responses to an environmental stimulus, drought, are contingent on environmental history, the transcriptome-level drought responses of three economically important hybrid genotypes-DN34 (Populus deltoides x Populus nigra), Walker [P. deltoides var. occidentalis x (Populus laurifolia x P. nigra)], and Okanese [Walker x (P. laurifolia x P. nigra)]-derived from two different locations were compared. Strikingly, differences in transcript abundance patterns in response to drought were based on differences in geographic origin of clones for two of the three genotypes. This observation was most pronounced for the genotypes with the longest time since establishment and last common propagation. Differences in genome-wide DNA methylation paralleled the transcriptome level trends, whereby the clones with the most divergent transcriptomes and clone history had the most marked differences in the extent of total DNA methylation, suggesting an epigenomic basis for the clone history-dependent transcriptome divergence. The data provide insights into the interplay between genotype and environment in the ecologically and economically important Populus genus, with implications for the industrial application of Populus trees and the evolution and persistence of these important tree species and their associated hybrids.

Date JUL 26 2011
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:37
Extra Place: Washington Publisher: Natl Acad Sciences WOS:000293129900064
Volume 108
Pages 12521-12526
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.1103341108
Issue 30
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
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Tags:

differentiation, divergence, dna methylation, epigenetics, forest trees, genetic-variation, plant, poplar, populations, stress, transcriptome, tremuloides, trichocarpa

Attachments

- Full Text

Coarse climate change projections for species living in a fine-scaled world

Type	Journal Article
Author	Christopher P. Nadeau
Author	Mark C. Urban
Author	Jon R. Bridle
Abstract	Accurately predicting biological impacts of climate change is necessary to guide policy. However, the resolution of climate data could be affecting the accuracy of climate change impact assessments. Here, we review the spatial and temporal resolution of climate data used in impact assessments and demonstrate that these resolutions are often too coarse relative to biologically relevant scales. We then develop a framework that partitions climate into three important components: trend, variance, and autocorrelation. We apply this framework to map different global climate regimes and identify where coarse climate data is most and least likely to reduce the accuracy of impact assessments. We show that impact assessments for many large mammals and birds use climate data with a spatial resolution similar to the biologically relevant area encompassing population dynamics. Conversely, impact assessments for many small mammals, herpetofauna, and plants use climate data with a spatial resolution that is orders of magnitude larger than the area encompassing population dynamics. Most impact assessments also use climate data with a coarse temporal resolution. We suggest that climate data with a coarse spatial resolution is likely to reduce the accuracy of impact assessments the most in climates with high spatial trend and variance (e.g., much of western North and South America) and the least in climates with low spatial trend and variance (e.g., the Great Plains of the USA). Climate data with a coarse temporal resolution is likely to reduce the accuracy of impact assessments the most in the northern half of the northern hemisphere where temporal climatic variance is high. Our framework provides one way to identify where improving the resolution of climate data will have the largest impact on the accuracy of biological predictions under climate change.
Date	JAN 2017
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed	15/03/2023, 14:47:10
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Volume	23
Pages	12-24
Publication	Global Change Biology
DOI	10.1111/gcb.13475
Issue	1
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:47:34
Modified	15/03/2023, 14:47:34

Tags:

autocorrelation, coexistence, dispersal distances, environmental variability, evolution, extinction risk, grid size, impact assessment, impacts, noise, populations, responses, spatial resolution, spatial scaling, temporal resolution, trend, variance

Attachments

- Accepted Version

Colonization of the Lesser Antilles by land birds

Type	Journal Article
Author	Robert E. Ricklefs
Abstract	This study addresses characteristics of source and island populations of nonraptorial land birds that have colonized the Lesser Antilles to determine whether colonization by individual source populations is a continuous process or occurs in transient phases. Species were classed as non-colonists, recent colonists, old endemic residents in the Lesser Antilles, and old endemic taxa that had recently spread within the archipelago. If colonization were transient, source populations of recent colonists would be more widely distributed than source populations of older, endemic island species. I compared the ecological and geographic distributions of source populations and island populations for each of the colonization groups based on a variety of literature and field data. Ages of colonization events and spread within the islands were determined by sequence divergence in mitochondrial genes, where available; relative ages were otherwise inferred from taxonomic differentiation and gaps in island distribution. Within the Lesser Antilles, old colonists, whether endemic or recently spread, tended to inhabit forest rather than open environments. Recently spread old colonists, like young colonists, had relatively greater abundance and broader habitat distribution within islands. These patterns were paralleled in northern South American source populations, but the trends were relatively weak. The strongest pattern was the propensity for source populations of young colonists and older, re-expanded endemics to occur independently on islands off the Caribbean coast of Venezuela. In comparisons with non-colonists in Trinidad, species that have recently colonized the Lesser Antilles tended to occur in more open habitats and to be more abundant locally, as well as more widespread through continental zoogeographical zones. Nested ANOVA based on a taxonomic hierarchy demonstrated that relative abundance and ecological and geographic distributions are labile, most of the variation being among species within genera. This is consistent with the idea that periods of high population productivity leading to colonization of offshore islands are transient. The existence of such phases can be inferred from correlations, albeit weak, between the status of populations in the Lesser Antilles and the ecological and geographic distribution of their putative source populations in the mainland.
Date	JUN 2010
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:28:05
Extra	Place: Hoboken Publisher: Wiley WOS:000278859700025
Volume	91

Pages 1811-1821
Publication Ecology
DOI 10.1890/09-0682.1
Issue 6
Journal Abbr Ecology
ISSN 0012-9658
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

avifaunas, biogeography, colonization, differentiation, distributions, diversity, ecological distribution, extinction, island biogeography, land birds, Lesser Antilles, mainland source populations, mitochondrial DNA sequence divergence, patterns, size, speciation, taxon cycles

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Community-level regulation of temporal trends in biodiversity

Type Journal Article
Author Nicholas J. Gotelli
Author Hideyasu Shimadzu
Author Maria Dornelas
Author Brian McGill
Author Faye Moyes
Author Anne E. Magurran
Abstract Many theoretical models of community dynamics predict that species richness (S) and total abundance (N) are regulated in their temporal fluctuations. We present novel evidence for widespread regulation of biodiversity. For 59 plant and animal assemblages from around the globe monitored annually for a decade or more, the majority exhibited regulated fluctuations compared to the null hypothesis of an unconstrained random walk. However, there was little evidence for statistical artifacts, regulation driven by correlations with average annual temperature, or local-scale compensatory fluctuations in S or N. In the absence of major environmental perturbations, such as urbanization or cropland transformation, species richness and abundance may be buffered and exhibit some resilience in their temporal trajectories. These results suggest that regulatory processes are occurring despite unprecedented environmental change, highlighting the need for community-level assessment of biodiversity trends, as well as extensions of existing theory to address open source pools and shifting environmental conditions.
Date JUL 2017
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:54
Extra Place: Washington Publisher: Amer Assoc Advancement Science WOS:000411588000050
Volume 3
Pages e1700315
Publication Science Advances

DOI 10.1126/sciadv.1700315
Issue 7
Journal Abbr Sci. Adv.
ISSN 2375-2548
Date Added 15/03/2023, 14:27:14
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Tags:

associations, bird community, consequences, density-dependence, diversity, dynamics, marine, models, population, species richness

Attachments

- Full Text

Comparing edge and fragmentation effects within seagrass communities: A meta-analysis

Type Journal Article
Author Amy H. Yarnall
Author James E. Byers
Author Lauren A. Yeager
Author F. Joel Fodrie
Abstract Examining community responses to habitat configuration across scales informs basic and applied models of ecosystem function. Responses to patch-scale edge effects (i.e., ecological differences between patch edges and interiors) are hypothesized to underpin the effects of landscape-scale fragmentation (i.e., mosaics of multipatch habitat and matrix). Conceptually, this appears justifiable because fragmented habitats typically have a greater proportion of edge than continuous habitats. To critically inspect whether patch-scale edge effects translate consistently (i.e., scale up) into patterns observed in fragmented landscapes, we conducted a meta-analysis on community relationships in seagrass ecosystems to synthesize evidence of edge and fragmentation effects on shoot density, faunal densities, and predation rates. We determined effect sizes by calculating log response ratios for responses within patch edges versus interiors to quantify edge effects, and fragmented versus continuous landscapes to quantify fragmentation effects. We found that both edge and fragmentation effects reduced seagrass shoot densities, although the effect of edge was statistically stronger. By contrast, fauna often exhibited higher densities in patch edges, while fragmentation responses varied directionally across taxa. Fish densities trended higher in patch edges and fragmented landscapes. Benthic fishes responded more positively than benthopelagic fishes to edge effects, although neither guild strongly responded to fragmentation. Invertebrate densities increased in patch edges and trended lower in fragmented landscapes; however, these were small effect sizes due to the offsetting responses of two dominant epifaunal guilds: decapods and smaller crustaceans. Edge and fragmentation affected predation similarly, with prey survival trending lower in patch edges and fragmented landscapes. Overall, several similarities suggested that edge effects conform with patterns of community dynamics in fragmented seagrass. However, across all metrics except fish densities, variability in fragmentation effects was twice that of edge effects. Variance patterns combined with generally stronger responses to edge than fragmentation, warrant caution in unilaterally "scaling-up"

edge effects to describe fragmentation effects. Alternatively, fragmentation includes additional factors (e.g., matrix effects, patch number, mean patch size, isolation) that may enhance or offset edge effects. Fragmentation and increased edge are syndromes of habitat degradation, therefore this analysis informs mechanistic models of community change in altered terrestrial and marine systems.

Date	MAR 2022
Language	English
Short Title	Comparing edge and fragmentation effects within seagrass communities
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:27:11
Extra	Place: Hoboken Publisher: Wiley WOS:000747805900001
Volume	103
Pages	e3603
Publication	Ecology
DOI	10.1002/ecy.3603
Issue	3
Journal Abbr	Ecology
ISSN	0012-9658
Date Added	15/03/2023, 14:27:14
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Tags:

biogenic complexity, complexity, density, ecological responses, fish, growth, habitat fragmentation, landscape, landscapes, patch, populations, scale, scale dependence, survival

Attachments

- Submitted Version

Complex causes of insect declines

Type	Journal Article
Author	Diana E. Bowler
Date	OCT 2021
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:26:47
Extra	Place: Berlin Publisher: Nature Portfolio WOS:000674527000003
Volume	5
Pages	1334-1335
Publication	Nature Ecology & Evolution
DOI	10.1038/s41559-021-01508-x
Issue	10

Journal Abbr Nat. Ecol. Evol.
ISSN 2397-334X
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

abundance, butterflies, cycle, data integration, population, trends

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Complex responses to climate drivers in onset of spring flowering across a semi-arid elevation gradient

Type Journal Article
Author Theresa M. Crimmins
Author Michael A. Crimmins
Author C. David Bertelsen
Abstract P>1. Many studies have documented advancement in spring plant phenology; however, studies in dry climates, where water, rather than temperature, is the limiting factor, are rare. To better understand how plants of a water-limited environment may respond to predicted changes in climate, we used a species-rich 20-year data set collected in a semi-arid ecosystem to determine species' relationships with precipitation and temperature for seasons coincident with and previous to flowering. Our data were collected across a 1200-m elevation gradient, allowing us to explore the consistency in relationships with climatic variables from desert scrub to pine forest. A second objective was to document evidence of changes in the onset of spring flowering over this 20-year period. 2. Onset of spring flowering for species at the lowest elevations was most commonly driven by temperature and precipitation conditions of the previous autumn. In contrast, onset of spring flowering for species in high-elevation communities was more often associated with spring temperatures, a pattern consistent with communities of higher latitudes. Despite these coarse patterns, species' relationships to climate variables were highly variable and individualistic. 3. Approximately 10% of species showed a significant trend in changes in first flowering date over the period 1984-2003; most trends were in the direction of later onset. The decrease in autumn precipitation observed over the study period appears to explain the delay in onset observed for many of the species across the elevation gradient. Other species' delays in spring flowering appear to be related to the slight decrease in spring temperature observed over the study period. 4. Synthesis. The south-western USA is expected to become warmer and drier. Climate relationships documented in this study suggest divergent, individualistic changes in the onset of spring flowering. Low-elevation plants may exhibit delayed spring flowering due to changes in the timing or amount of precipitation or insufficient chilling. High-elevation species may show advancement in spring flowering due to warming temperatures. The highly individualistic responses to climate change may result in significant changes in the diversity, composition and abundance of plants in flower. Variable changes in phenology such as these have major implications for species population dynamics and ecosystem functioning.
Date SEP 2010
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3

Accessed 15/03/2023, 14:29:33
Extra Place: Hoboken Publisher: Wiley WOS:000280667200007
Volume 98
Pages 1042-1051
Publication Journal of Ecology
DOI 10.1111/j.1365-2745.2010.01696.x
Issue 5
Journal Abbr J. Ecol.
ISSN 0022-0477
Date Added 15/03/2023, 14:29:40
Modified 15/03/2023, 14:29:40

Tags:

annual plants, Arizona, climate change, columnar cacti, desert, el-nino, elevation gradient, first flowering date, fruit, patterns, phenology, plant-climate interactions, reproductive phenology, semi-arid environment, temperature, time, winter chill

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Consistent population declines but idiosyncratic range shifts in Alpine orchids under global change

Type Journal Article
Author Costanza Geppert
Author Giorgio Perazza
Author Robert J. Wilson
Author Alessio Bertolli
Author Filippo Prosser
Author Giuseppe Melchiori
Author Lorenzo Marini
Abstract Mountains are plant biodiversity hotspots considered particularly vulnerable to multiple environmental changes. Here, we quantify population changes and range-shift dynamics along elevational gradients over the last three decades for c. two-thirds of the orchid species of the European Alps. Local extinctions were more likely for small populations, after habitat alteration, and predominated at the rear edge of species' ranges. Except for the most thermophilic species and wetland specialists, population density decreased over time. Declines were more pronounced for rear-edge populations, possibly due to multiple pressures such as climate warming, habitat alteration, and mismatched ecological interactions. Besides these demographic trends, different species exhibited idiosyncratic range shifts with more than 50% of the species lagging behind climate warming. Our study highlights the importance of long-term monitoring of populations and range distributions at fine spatial resolution to be able to fully understand the consequences of global change for orchids. Many mountain species are threatened by climate change and habitat loss. Here, the authors investigate population declines and range shifts of orchids in an alpine region in NE Italy over 28 years. For most species, population size decreased, while range shifts were idiosyncratic with over half of the species lagging behind climate change.
Date NOV 17 2020
Language English

Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:24
Extra Place: Berlin Publisher: Nature Portfolio WOS:000594728700012
Volume 11
Pages 5835
Publication Nature Communications
DOI 10.1038/s41467-020-19680-2
Issue 1
Journal Abbr Nat. Commun.
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

alps, climate-change, dynamics, expansion, impact, landscape, plant-responses, species responses

Attachments

- Full Text

Consistent response of bird populations to climate change on two continents

Type Journal Article
Author Philip A. Stephens
Author Lucy R. Mason
Author Rhys E. Green
Author Richard D. Gregory
Author John R. Sauer
Author Jamie Alison
Author Ainars Aunins
Author Lluis Brotons
Author Stuart H. M. Butchart
Author Tommaso Campedelli
Author Tomasz Chodkiewicz
Author Przemyslaw Chylarecki
Author Olivia Crowe
Author Jaanus Elts
Author Virginia Escandell
Author Ruud P. B. Foppen
Author Henning Heldbjerg
Author Sergi Herrando
Author Magne Husby
Author Frederic Jiguet
Author Aleksi Lehikoinen
Author Ake Lindstrom

Author David G. Noble
Author Jean-Yves Paquet
Author Jiri Reif
Author Thomas Sattler
Author Tibor Szep
Author Norbert Teufelbauer
Author Sven Trautmann
Author Arco J. van Strien
Author Chris A. M. van Turnhout
Author Petr Vorisek
Author Stephen G. Willis

Abstract Global climate change is a major threat to biodiversity. Large-scale analyses have generally focused on the impacts of climate change on the geographic ranges of species and on phenology, the timing of ecological phenomena. We used long-term monitoring of the abundance of breeding birds across Europe and the United States to produce, for both regions, composite population indices for two groups of species: those for which climate suitability has been either improving or declining since 1980. The ratio of these composite indices, the climate impact indicator (CII), reflects the divergent fates of species favored or disadvantaged by climate change. The trend in CII is positive and similar in the two regions. On both continents, interspecific and spatial variation in population abundance trends are well predicted by climate suitability trends.

Date APR 1 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:53
Extra Place: Washington Publisher: Amer Assoc Advancement Science WOS:000373039600040
Volume 352
Pages 84-87
Publication Science
DOI 10.1126/science.aac4858
Issue 6281
Journal Abbr Science
ISSN 0036-8075
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

body-size, dynamics, impacts

Attachments

- Accepted Version

Consistent signals of a warming climate in occupancy changes of three insect taxa over 40 years in central Europe

Type Journal Article

Author Eva Katharina Engelhardt
Author Matthias F. Biber
Author Matthias Dolek
Author Thomas Fartmann
Author Axel Hochkirch
Author Jan Leidinger
Author Franz Loeffler
Author Stefan Pinkert
Author Dominik Poniatowski
Author Johannes Voith
Author Michael Winterholler
Author Dirk Zeuss
Author Diana E. Bowler
Author Christian Hof

Abstract Recent climate and land-use changes are having substantial impacts on biodiversity, including population declines, range shifts, and changes in community composition. However, few studies have compared these impacts among multiple taxa, particularly because of a lack of standardized time series data over long periods. Existing data sets are typically of low resolution or poor coverage, both spatially and temporally, thereby limiting the inferences that can be drawn from such studies. Here, we compare climate and land-use driven occupancy changes in butterflies, grasshoppers, and dragonflies using an extensive data set of highly heterogeneous observation data collected in the central European region of Bavaria (Germany) over a 40-year period. Using occupancy models, we find occupancies (the proportion of sites occupied by a species in each year) of 37% of species have decreased, 30% have increased and 33% showed no significant trend. Butterflies and grasshoppers show strongest declines with 41% of species each. By contrast, 52% of dragonfly species increased. Temperature preference and habitat specificity appear as significant drivers of species trends. We show that cold-adapted species across all taxa have declined, whereas warm-adapted species have increased. In butterflies, habitat specialists have decreased, while generalists increased or remained stable. The trends of habitat generalists and specialists both in grasshoppers and semi-aquatic dragonflies, however did not differ. Our findings indicate strong and consistent effects of climate warming across insect taxa. The decrease of butterfly specialists could hint towards a threat from land-use change, as especially butterfly specialists' occurrence depends mostly on habitat quality and area. Our study not only illustrates how these taxa showed differing trends in the past but also provides hints on how we might mitigate the detrimental effects of human development on their diversity in the future.

Date JUL 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:16
Extra Place: Hoboken Publisher: Wiley WOS:000792676700001
Volume 28

Pages 3998-4012
Publication Global Change Biology
DOI 10.1111/gcb.16200
Issue 13
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34
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Tags:

abundance, arthropod, biodiversity, butterfly communities, climate change, cross-taxon, decline, dragonflies, habitat quality, land-use, long term, long-term, monitoring, occupancy model, orthoptera assemblages, responses, specialization, trait, trend, trends

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Continent-scale global change attribution in European birds - combining annual and decadal time scales

Type Journal Article
Author Peter Sogaard Jorgensen
Author Katrin Boehning-Gaese
Author Kasper Thorup
Author Anders P. Tottrup
Author Przemyslaw Chylarecki
Author Frederic Jiguet
Author Aleksi Lehikoinen
Author David G. Noble
Author Jiri Reif
Author Hans Schmid
Author Chris van Turnhout
Author Ian J. Burfield
Author Ruud Foppen
Author Petr Vorisek
Author Arco van Strien
Author Richard D. Gregory
Author Carsten Rahbek
Abstract Species attributes are commonly used to infer impacts of environmental change on multiyear species trends, e.g. decadal changes in population size. However, by themselves attributes are of limited value in global change attribution since they do not measure the changing environment. A broader foundation for attributing species responses to global change may be achieved by complementing an attributes-based approach by one estimating the relationship between repeated measures of organismal and environmental changes over short time scales. To assess the benefit of this multiscale perspective, we investigate the recent impact of multiple environmental changes on European farmland birds, here focusing on climate change and land use change. We analyze more than 800 time series from 18 countries spanning the past two decades. Analysis of long-term population growth rates documents simultaneous responses that can be attributed to both climate

change and land-use change, including long-term increases in populations of hot-dwelling species and declines in long-distance migrants and farmland specialists. In contrast, analysis of annual growth rates yield novel insights into the potential mechanisms driving long-term climate induced change. In particular, we find that birds are affected by winter, spring, and summer conditions depending on the distinct breeding phenology that corresponds to their migratory strategy. Birds in general benefit from higher temperatures or higher primary productivity early on or in the peak of the breeding season with the largest effect sizes observed in cooler parts of species' climatic ranges. Our results document the potential of combining time scales and integrating both species attributes and environmental variables for global change attribution. We suggest such an approach will be of general use when high-resolution time series are available in large-scale biodiversity surveys.

Date FEB 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:24
Extra Place: Hoboken Publisher: Wiley WOS:000369135400005
Volume 22
Pages 530-543
Publication Global Change Biology
DOI 10.1111/gcb.13097
Issue 2
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Modified 15/03/2023, 14:47:34

Tags:

agricultural intensification, biodiversity, citizen science, climate change, climate-change, conservation, farmland birds, global change attribution, impacts, indicators, land-use change, migrant birds, migratory birds, multiple temporal scales, multiscale inference, population time series, term population declines

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Continent-wide gradients in open-habitat insectivorous bird declines track spatial patterns in agricultural intensity across Europe

Type Journal Article

Author Jiri Reif
Author Jan Hanzelka

Abstract Aim To investigate spatial gradients in population trends of European birds in relation to their association with farmland, dietary dependence on insects, and the intensity of agricultural practices. Location Europe. Time period 2001-2012. Major taxa studied Birds. Methods We collected population trends for 197 species in 32 European countries. For the same time period, we used agricultural variables (annual yields of five major crops and the per-hectare application of pesticides and fertilizers) to express the agricultural intensity level (mean values of variables over the years) and intensification rate (slopes of agricultural variables over the years) in each country. We employed spatial generalized additive mixed models accounting for the effects of 11 species' traits and phylogeny to test for spatial gradients in bird population trends in relation to species' associations with farmland and their diet dependence on insects and the interaction of these traits with agricultural intensity levels and intensification rates. Results Open-habitat insectivores showed the strongest spatial gradient in population trends, from insignificant trends in south-eastern Europe to steep declines in north-western Europe. Insectivorous species breeding in semi-open habitats showed very similar but weaker spatial gradient in trends. More negative bird trends were related to higher mean crop yields and fertilizer amounts across countries, whereas the temporal trends in yields and fertilizer amounts, and the mean and temporal trend in the amount of pesticides, were unrelated to bird declines or showed the opposite patterns. Main conclusions Our results indicate that high agricultural intensity levels are stronger drivers of spatial gradients in population declines of insectivorous farmland birds than intensification rates. Therefore, approaches to the conservation of farmland birds may differ regionally: introducing more management for birds and insects into highly intensive agriculture in north-western Europe and preventing further intensification in south-eastern Europe.

Date	NOV 2020
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed	15/03/2023, 14:46:59
Extra	Place: Hoboken Publisher: Wiley WOS:000569072300001
Volume	29
Pages	1988-2013
Publication	Global Ecology and Biogeography
DOI	10.1111/geb.13170
Issue	11
Journal Abbr	Glob. Ecol. Biogeogr.
ISSN	1466-822X
Date Added	15/03/2023, 14:47:34
Modified	15/03/2023, 14:47:34

Tags:

abundance, agriculture, biodiversity, climate-change, conservation, diet, Europe, farmland bird, farmland birds, insect, intensification, land-use, management, north-america, population trend, population trends

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Continental-scale determinants of population trends in European amphibians and reptiles

Type	Journal Article
Author	Mattia Falaschi
Author	Raoul Manenti
Author	Wilfried Thuiller
Author	Gentile Francesco Ficetola

Abstract The continuous decline of biodiversity is determined by the complex and joint effects of multiple environmental drivers. Still, a large part of past global change studies reporting and explaining biodiversity trends have focused on a single driver.

Therefore, we are often unable to attribute biodiversity changes to different drivers, since a multivariable design is required to disentangle joint effects and interactions. In this work, we used a meta-regression within a Bayesian framework to analyze 843 time series of population abundance from 17 European amphibian and reptile species over the last 45 years. We investigated the relative effects of climate change, alien species, habitat availability, and habitat change in driving trends of population abundance over time, and evaluated how the importance of these factors differs across species. A large number of populations (54%) declined, but differences between species were strong, with some species showing positive trends. Populations declined more often in areas with a high number of alien species, and in areas where climate change has caused loss of suitability. Habitat features showed small variation over the last 25 years, with an average loss of suitable habitat of 0.1%/year per population. Still, a strong interaction between habitat availability and the richness of alien species indicated that the negative impact of alien species was particularly strong for populations living in landscapes with less suitable habitat. Furthermore, when excluding the two commonest species, habitat loss was the main correlate of negative population trends for the remaining species. By analyzing trends for multiple species across a broad spatial scale, we identify alien species, climate change, and habitat changes as the major drivers of European amphibian and reptile decline.

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Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
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Extra Place: Hoboken Publisher: Wiley WOS:000478221900001
Volume 25
Pages 3504-3515
Publication Global Change Biology
DOI 10.1111/gcb.14739
Issue 10
Journal Abbr Glob. Change Biol.
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Tags:

alien, alien species, biodiversity, climate change, climate-change, consequences, conservation, decline, demography, distributions, impact, land-cover change, land-use, meta-analysis, models, population trends, species distribution models

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Contingent factors explain average divergence in functional composition over 88 years of old field succession

Type Journal Article
Author Adam Thomas Clark
Author Johannes M. H. Knops
Author Dave Tilman

Abstract "Old fields" are ecosystems that have been previously managed and subsequently abandoned, usually from agricultural use. These systems are classic testing grounds for hypotheses about community assembly. However, old field succession can be difficult to predict: seemingly similar fields often diverge in terms of species composition and environmental conditions. Here, we test the relative roles of contingency and stochasticity in driving vegetative successional dynamics. We draw on three decades of surveys in 24 old fields at the Cedar Creek Ecosystem Science Reserve (Minnesota, USA), and focus on five drivers that are known to shape local plant communities: soil fertility, fire, climate, competition, and demography. These drivers can contribute to contingency when they act consistently across fields and years (e.g., soil nitrogen accumulation, experimental fire regimes, or average climate), or to stochasticity when their effects are variable (e.g., annual variations in weather, or colonization and mortality events). We proceed in two steps. First, we fit regressions estimating abundance, colonization, and mortality for eight major functional groups in relation to these five drivers. We then use these regressions to parameterize a series of metacommunity simulation models, and test whether observed levels of stochasticity and variation in the drivers are sufficient to explain successional divergence. All drivers were significantly associated with plant species abundances, colonization, and mortality. Contingent factors strongly altered predicted successional trajectories. However, replicate simulations with similar conditions followed similar successional trajectories, suggesting that stochastic processes did not lead to divergence. This robustness of successional dynamics may be explained by compensatory trade-offs. For example, species that were abundant late in succession typically suffered from low colonization rates and high mortality rates early in succession. Synthesis. Average successional dynamics among old fields at Cedar Creek follow largely consistent trends. Though dynamics of individual fields vary, much of this variation can be explained by contingent factors. Stochastic processes appear not to be sufficiently strong to create divergent successional trajectories among fields with similar sets of drivers. Our results therefore suggest that divergence among successional trajectories in chronosequences may be the result of predictable contingent factors, rather than unpredictable stochastic fluctuations.

Date MAR 2019

Language English

Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3

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Issue 2

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Tags:

biodiversity, community structure, competition, dynamics, environmental driver, grassland, interspecific competition, metacommunity, nitrogen, nutrients, old field succession, patterns, plant population and community dynamics, plant community assembly, plant diversity, secondary succession, soil carbon

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Contrasting bottom-up effects of warming ocean on two king penguin populations

Type	Journal Article
Author	Emile Brisson-Curadeau
Author	Kyle Elliott
Author	Charles-Andre Bost
Abstract	Breeding success is often correlated with climate, but the underlying bottom-up mechanisms remain elusive-particularly in marine environments. Consequently, conservation plans of many species often consider climate change as a unilateral threat, ignoring that even nearby populations can show contradicting trends with climate. Better understanding the relationship between climate and environment at different scales can help us interpret local differences in population trends, ultimately providing better tools to evaluate the global response of a species to threats such as global warming. We studied a growing king penguin population nesting at Kerguelen island (Southern Indian Ocean), hosting one of the largest colonies in the world. We used a unique dataset of foraging, breeding success, and climate data spanning over 25 years to examine the links between climate, marine environment, and breeding success at this colony. The results were then compared to the neighboring population of Crozet, which experienced the steepest decline for this species over the past few decades. At Crozet, penguins experienced lower breeding success in warmer years due to productive currents shifting away from the colony, affecting foraging behavior during chick rearing. At Kerguelen, while chick mass and survival experienced extreme variation from year to year, the annual variation was not associated with the position of the currents, which varied very little compared to the situation in Crozet. Rather than being affected by prey distribution shifts, we found evidence that chick provisioning in Kerguelen might be influenced by prey abundance, which seem to rather increase in warmer conditions. Furthermore, warmer air temperature in winter increased chick survival rate, likely due to reduced thermoregulation cost. Investigating the mechanisms between climate and fitness allowed us to predict two different fates for these populations regarding ongoing global warming.
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:16
Extra	Place: Hoboken Publisher: Wiley WOS:000884579800001
Publication	Global Change Biology
DOI	10.1111/gcb.16519
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

aptenodytes-patagonicus, breeding success, chicks, circulation, climate change, fish size, growth, king penguin, marine ecosystem, migration, ocean temperature, polar front, prey, Southern Ocean, temperature, variability

Attachments

- Full Text

Contrasting changes in the abundance and diversity of North American bird assemblages from 1971 to 2010

Type Journal Article
Author Aafke M. Schipper
Author Jonathan Belmaker
Author Murilo Dantas de Miranda
Author Laetitia M. Navarro
Author Katrin Boehning-Gaese
Author Mark J. Costello
Author Maria Dornelas
Author Ruud Foppen
Author Joaquin Hortal
Author Mark A. J. Huijbregts
Author Berta Martin-Lopez
Author Nathalie Pettorelli
Author Cibele Queiroz
Author Axel G. Rossberg
Author Luca Santini
Author Katja Schiffers
Author Zoran J. N. Steinmann
Author Piero Visconti
Author Carlo Rondinini
Author Henrique M. Pereira
Abstract Although it is generally recognized that global biodiversity is declining, few studies have examined long-term changes in multiple biodiversity dimensions simultaneously. In this study, we quantified and compared temporal changes in the abundance, taxonomic diversity, functional diversity, and phylogenetic diversity of bird assemblages, using roadside monitoring data of the North American Breeding Bird Survey from 1971 to 2010. We calculated 12 abundance and diversity metrics based on 5-year average abundances of 519 species for each of 768 monitoring routes. We did this for all bird species together as well as for four subgroups based on breeding habitat affinity (grassland, woodland, wetland, and shrubland breeders). The majority of the biodiversity metrics increased or remained constant over the study period, whereas the overall abundance of birds showed a pronounced decrease, primarily driven by declines of the most abundant species. These results highlight how stable or even increasing metrics of taxonomic, functional, or phylogenetic diversity may occur in parallel with substantial losses of individuals. We further found that patterns of change differed among the species subgroups, with

both abundance and diversity increasing for woodland birds and decreasing for grassland breeders. The contrasting changes between abundance and diversity and among the breeding habitat groups underscore the relevance of a multifaceted approach to measuring biodiversity change. Our findings further stress the importance of monitoring the overall abundance of individuals in addition to metrics of taxonomic, functional, or phylogenetic diversity, thus confirming the importance of population abundance as an essential biodiversity variable.

Date DEC 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:50:45
Extra Place: Hoboken Publisher: Wiley WOS:000387813300011
Volume 22
Pages 3948-3959
Publication Global Change Biology
DOI 10.1111/gcb.13292
Issue 12
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:51:19
Modified 15/03/2023, 14:51:19

Tags:

biodiversity change, biodiversity metrics, communities, conservation, extinctions, functional diversity, functional diversity (FD), homogenization, indicators, phylogenetic diversity, phylogenetic diversity (PD), populations, species abundance, taxonomic diversity (TD), trends

Attachments

- Full Text

Contrasting consequences of climate change for migratory geese: Predation, density dependence and carryover effects offset benefits of high-arctic warming

Type Journal Article

Author Kate Layton-Matthews
Author Brage Bremset Hansen
Author Vidar Grotan
Author Eva Fuglei
Author Maarten J. J. E. Loonen

Abstract Climate change is most rapid in the Arctic, posing both benefits and challenges for migratory herbivores. However, population-dynamic responses to climate change are generally difficult to predict, due to concurrent changes in other trophic levels. Migratory species are also exposed to contrasting climate trends and density regimes over the annual cycle. Thus, determining how climate change impacts their population dynamics requires an understanding of how weather directly or indirectly (through trophic interactions and carryover effects) affects reproduction and survival across migratory stages, while accounting for density dependence. Here, we analyse the overall implications of climate change for a local non-hunted population of high-arctic Svalbard barnacle geese, Branta leucopsis, using 28 years of individual-based data. By identifying the main drivers of reproductive stages (egg production, hatching and fledging) and age-specific survival rates, we quantify their impact on population growth. Recent climate change in Svalbard enhanced egg production and hatching success through positive effects of advanced spring onset (snow melt) and warmer summers (i.e. earlier vegetation green-up) respectively. Contrastingly, there was a strong temporal decline in fledging probability due to increased local abundance of the Arctic fox, the main predator. While weather during the non-breeding season influenced geese through a positive effect of temperature (UK wintering grounds) on adult survival and a positive carryover effect of rainfall (spring stopover site in Norway) on egg production, these covariates showed no temporal trends. However, density-dependent effects occurred throughout the annual cycle, and the steadily increasing total flyway population size caused negative trends in overwinter survival and carryover effects on egg production. The combination of density-dependent processes and direct and indirect climate change effects across life history stages appeared to stabilize local population size. Our study emphasizes the need for holistic approaches when studying population-dynamic responses to global change in migratory species.

Date	FEB 2020
Language	English
Short Title	Contrasting consequences of climate change for migratory geese
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:08
Extra	Place: Hoboken Publisher: Wiley WOS:000482832000001
Volume	26
Pages	642-657
Publication	Global Change Biology
DOI	10.1111/gcb.14773
Issue	2
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

Arctic amplification, Arctic geese, barnacle geese, barnacle goose, carryover effects, climate change, environmental stochasticity, goose branta-leucopsis, long-distance migrant, migration, pink-footed geese, plant phenology, population dynamics, population-dynamics, reproductive success, snow geese, trophic interactions

Attachments

- Full Text

Contrasting effects of climate on juvenile body size in a Southern Hemisphere passerine bird

Type Journal Article

Author Loeske E. B. Kruuk
Author Helen L. Osmond
Author Andrew Cockburn

Abstract Despite extensive research on the topic, it has been difficult to reach general conclusions as to the effects of climate change on morphology in wild animals: in particular, the effects of warming temperatures have been associated with increases, decreases or stasis in body size in different populations. Here, we use a fine-scale analysis of associations between weather and offspring body size in a long-term study of a wild passerine bird, the cooperatively breeding superb fairy-wren, in south-eastern Australia to show that such variation in the direction of associations occurs even within a population. Over the past 26years, our study population has experienced increased temperatures, increased frequency of heatwaves and reduced rainfall - but the mean body mass of chicks has not changed. Despite the apparent stasis, mass was associated with weather across the previous year, but in multiple counteracting ways. Firstly, (i) chick mass was negatively associated with extremely recent heatwaves, but there also positive associations with (ii) higher maximum temperatures and (iii) higher rainfall, both occurring in a period prior to and during the nesting period, and finally (iv) a longer-term negative association with higher maximum temperatures following the previous breeding season. Our results illustrate how a morphological trait may be affected by both short- and long-term effects of the same weather variable at multiple times of the year and that these effects may act in different directions. We also show that climate within the relevant time windows may not be changing in the same way, such that overall long-term temporal trends in body size may be minimal. Such complexity means that analytical approaches that search for a single best' window for one particular weather variable may miss other relevant information, and is also likely to make analyses of phenotypic plasticity and prediction of longer-term population dynamics difficult.

Date AUG 2015
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:28
Extra Place: Hoboken Publisher: Wiley WOS:000358485200011
Volume 21
Pages 2929-2941
Publication Global Change Biology
DOI 10.1111/gcb.12926
Issue 8
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

Australia, bergmanns rule, body mass, breeding birds, climate change, heatwave, insect abundance, Malurus cyaneus, maternal effects, maximum temperature, phenology, phenotypic plasticity, rainfall, reproductive traits, responses, superb fairy-wren, temperature, warming world, wild

Attachments

- Accepted Version

Contrasting effects of summer and winter warming on body mass explain population dynamics in a food-limited Arctic herbivore

Type Journal Article

Author Steve D. Albon
Author R. Justin Irvine
Author Odd Halvorsen
Author Rolf Langvatn
Author Leif E. Loe
Author Erik Ropstad
Author Vebjorn Veiberg
Author Rene Van Der Wal
Author Eirin M. Bjorkvoll
Author Elizabeth I. Duff
Author Brage B. Hansen
Author Aline M. Lee
Author Torkild Tveraa
Author Audun Stien

Abstract The cumulative effects of climate warming on herbivore vital rates and population dynamics are hard to predict, given that the expected effects differ between seasons. In the Arctic, warmer summers enhance plant growth which should lead to heavier and more fertile individuals in the autumn. Conversely, warm spells in winter with rainfall (rain-on-snow) can cause `icing', restricting access to forage, resulting in starvation, lower survival and fecundity. As body condition is a `barometer' of energy demands relative to energy intake, we explored the causes and consequences of variation in body mass of wild female Svalbard reindeer (Rangifer tarandus platyrhynchus) from 1994 to 2015, a period of marked climate warming. Late winter (April) body mass explained 88% of the between-year variation in population growth rate, because it strongly influenced reproductive loss, and hence subsequent fecundity (92%), as well as survival (94%) and recruitment (93%). Autumn (October) body mass affected ovulation rates but did not affect fecundity. April body mass showed no long-term trend (coefficient of variation, CV = 8.8%) and was higher following warm autumn (October) weather, reflecting delays in winter onset, but most strongly, and negatively, related to `rain-on-snow' events. October body mass (CV = 2.5%) increased over the study due to higher plant productivity in the increasingly warm summers. Density-dependent mass change suggested competition for resources in both winter and summer but was less pronounced in recent years, despite an increasing population size. While continued climate warming is expected to increase the carrying capacity of the high Arctic tundra, it is also likely to cause more frequent icing events. Our analyses suggest that these contrasting effects may

cause larger seasonal fluctuations in body mass and vital rates. Overall our findings provide an important `missing' mechanistic link in the current understanding of the population biology of a keystone species in a rapidly warming Arctic.

Date	APR 2017
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:33
Extra	Place: Hoboken Publisher: Wiley WOS:000396836800002
Volume	23
Pages	1374-1389
Publication	Global Change Biology
DOI	10.1111/gcb.13435
Issue	4
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:52:53
Modified	15/03/2023, 14:52:53

Tags:

climate change, climate-change, deer odocoileus-virginianus, density dependence, density-dependence, extreme events, icing, linking climate, migratory caribou, nutrition, peary caribou, primary production, Rangifer, reindeer, responses, sensitive reproductive allocation, snow events, Svalbard, svalbard reindeer, weather

Attachments

- Full Text

Contrasting growth forecasts across the geographical range of Scots pine due to altitudinal and latitudinal differences in climatic sensitivity

Type	Journal Article
Author	Luis Matias
Author	Juan C. Linares
Author	Angelas Sanchez-Miranda
Author	Alistair S. Jump
Abstract	Ongoing changes in global climate are altering ecological conditions for many species. The consequences of such changes are typically most evident at the edge of a species' geographical distribution, where differences in growth or population dynamics may result in range expansions or contractions. Understanding population responses to different climatic drivers along wide latitudinal and altitudinal gradients is necessary in order to gain a better understanding of plant responses to ongoing increases in global temperature and drought severity. We selected Scots pine (Pinus sylvestris L.) as a model species to explore growth responses to climatic variability (seasonal temperature and precipitation) over the last century through

dendrochronological methods. We developed linear models based on age, climate and previous growth to forecast growth trends up to year 2100 using climatic predictions. Populations were located at the treeline across a latitudinal gradient covering the northern, central and southernmost populations and across an altitudinal gradient at the southern edge of the distribution (treeline, medium and lower elevations). Radial growth was maximal at medium altitude and treeline of the southernmost populations. Temperature was the main factor controlling growth variability along the gradients, although the timing and strength of climatic variables affecting growth shifted with latitude and altitude. Predictive models forecast a general increase in Scots pine growth at treeline across the latitudinal distribution, with southern populations increasing growth up to year 2050, when it stabilizes. The highest responsiveness appeared at central latitude, and moderate growth increase is projected at the northern limit. Contrastingly, the model forecasted growth declines at lowland-southern populations, suggesting an upslope range displacement over the coming decades. Our results give insight into the geographical responses of tree species to climate change and demonstrate the importance of incorporating biogeographical variability into predictive models for an accurate prediction of species dynamics as climate changes.

Date	OCT 2017
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:34
Extra	Place: Hoboken Publisher: Wiley WOS:000410642100013
Volume	23
Pages	4106-4116
Publication	Global Change Biology
DOI	10.1111/gcb.13627
Issue	10
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:52:53
Modified	15/03/2023, 14:52:53

Tags:

biotic interactions, climate, dendrochronology, distribution, drought, fagus-sylvatica, forest growth, growth, modelling, Pinus sylvestris, quercus-petraea, radial growth, responses, shifts, sylvestris, tree-ring width

Attachments

- Accepted Version

Cross-realm assessment of climate change impacts on species' abundance trends

Type	Journal Article
Author	Diana E. Bowler
Author	Christian Hof

Author Peter Haase
Author Ingrid Kroencke
Author Oliver Schweiger
Author Rita Adrian
Author Leon Baert
Author Hans-Guenther Bauer
Author Theo Blick
Author Rob W. Brooker
Author Wouter Dekoninck
Author Sami Domisch
Author Reiner Eckmann
Author Frederik Hendrickx
Author Thomas Hickler
Author Stefan Klotz
Author Alexandra Kraberg
Author Ingolf Kuehn
Author Silvia Matesanz
Author Angelika Meschede
Author Hermann Neumann
Author Robert O'Hara
Author David J. Russell
Author Anne F. Sell
Author Moritz Sonnewald
Author Stefan Stoll
Author Andrea Sundermann
Author Oliver Tackenberg
Author Michael Tuerkay
Author Fernando Valladares
Author Kok van Herk
Author Roel van Klink
Author Rikjan Vermeulen
Author Karin Voigtlaender
Author Ruediger Wagner
Author Erik Welk
Author Martin Wiemers
Author Karen H. Wiltshire
Author Katrin Boehning-Gaese

Abstract Climate change, land-use change, pollution and exploitation are among the main drivers of species' population trends; however, their relative importance is much debated. We used a unique collection of over 1,000 local population time series in 22 communities across terrestrial, freshwater and marine realms within central Europe to compare the impacts of long-term temperature change and other environmental drivers from 1980 onwards. To disentangle different drivers, we related species' population trends to species-and driver-specific attributes, such as temperature and habitat preference or pollution tolerance. We found a consistent impact of temperature change on the local abundances of terrestrial species. Populations of warm-dwelling species increased more than those of cold-dwelling species. In contrast, impacts of temperature change on aquatic species' abundances were variable. Effects of temperature preference were more consistent in terrestrial communities than effects of habitat preference, suggesting that the impacts of

temperature change have become widespread for recent changes in abundance within many terrestrial communities of central Europe.

Date MAR 2017
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:03
Extra Place: London Publisher: Nature Publishing Group WOS:000417170400017
Volume 1
Pages 0067
Publication Nature Ecology & Evolution
DOI 10.1038/s41559-016-0067
Issue 3
Journal Abbr Nat. Ecol. Evol.
ISSN 2397-334X
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

biodiversity, birds, communities, diversity, extinction risk, lichens, rivers, shifts, thermal regime

Attachments

- Full Text

Current temporal trends in moth abundance are counter to predicted effects of climate change in an assemblage of subarctic forest moths

Type Journal Article
Author Mark D. Hunter
Author Mikhail V. Kozlov
Author Juhani Itamies
Author Erkki Pulliainen
Author Jaana Back
Author Ella-Maria Kyro
Author Pekka Niemela
Abstract Changes in climate are influencing the distribution and abundance of the world's biota, with significant consequences for biological diversity and ecosystem processes. Recent work has raised concern that populations of moths and butterflies (Lepidoptera) may be particularly susceptible to population declines under environmental change. Moreover, effects of climate change may be especially pronounced in high latitude ecosystems. Here, we examine population dynamics in an assemblage of subarctic forest moths in Finnish Lapland to assess current trajectories of population change. Moth counts were made continuously over a period of 32years using light traps. From 456 species recorded, 80 were sufficiently abundant for detailed analyses of their population dynamics. Climate records indicated rapid increases in temperature and winter precipitation at our study site

during the sampling period. However, 90% of moth populations were stable (57%) or increasing (33%) over the same period of study. Nonetheless, current population trends do not appear to reflect positive responses to climate change. Rather, time-series models illustrated that the per capita rates of change of moth species were more frequently associated negatively than positively with climate change variables, even as their populations were increasing. For example, the per capita rates of change of 35% of microlepidoptera were associated negatively with climate change variables. Moth life-history traits were not generally strong predictors of current population change or associations with climate change variables. However, 60% of moth species that fed as larvae on resources other than living vascular plants (e.g. litter, lichen, mosses) were associated negatively with climate change variables in time-series models, suggesting that such species may be particularly vulnerable to climate change. Overall, populations of subarctic forest moths in Finland are performing better than expected, and their populations appear buffered at present from potential deleterious effects of climate change by other ecological forces.

Date	JUN 2014
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:50:44
Extra	Place: Hoboken Publisher: Wiley WOS:000336482700003
Volume	20
Pages	1723-1737
Publication	Global Change Biology
DOI	10.1111/gcb.12529
Issue	6
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

biodiversity, british butterflies, climate change, decline, density-dependence, ecological responses, extinction risk, forest insects, habitat, lepidoptera, life-history traits, moth declines, patterns, population-dynamics, temperature, time-series analysis

Attachments

- Full Text

Decline of the North American avifauna

Type	Journal Article
Author	Kenneth V. Rosenberg
Author	Adriaan M. Dokter
Author	Peter J. Blancher
Author	John R. Sauer

Author	Adam C. Smith
Author	Paul A. Smith
Author	Jessica C. Stanton
Author	Arvind Panjabi
Author	Laura Helft
Author	Michael Parr
Author	Peter P. Marra

Abstract Species extinctions have defined the global biodiversity crisis, but extinction begins with loss in abundance of individuals that can result in compositional and functional changes of ecosystems. Using multiple and independent monitoring networks, we report population losses across much of the North American avifauna over 48 years, including once-common species and from most biomes. Integration of range-wide population trajectories and size estimates indicates a net loss approaching 3 billion birds, or 29% of 1970 abundance. A continent-wide weather radar network also reveals a similarly steep decline in biomass passage of migrating birds over a recent 10-year period. This loss of bird abundance signals an urgent need to address threats to avert future avifaunal collapse and associated loss of ecosystem integrity, function, and services.

Date	OCT 4 2019
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:26:53
Extra	Place: Washington Publisher: Amer Assoc Advancement Science WOS:000489147000068
Volume	366
Pages	120-+
Publication	Science
DOI	10.1126/science.aaw1313
Issue	6461
Journal Abbr	Science
ISSN	0036-8075
Date Added	15/03/2023, 14:27:14
Modified	15/03/2023, 14:27:14

Tags:

birds, extinction, land-cover composition, risk, routes, shorebirds, trends

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Declines in moth populations stress the need for conserving dark nights

Type	Journal Article
Author	Frank van Langevelde
Author	Marijke Braamburg-Annegarn
Author	Martinus E. Huigens
Author	Rob Groendijk
Author	Olivier Poitevin
Author	Jurrien R. van Deijk

Author Willem N. Ellis
Author Roy H. A. van Grunsven
Author Rob de Vos
Author Rutger A. Vos
Author Markus Franzen
Author Michiel F. WallisDeVries

Abstract Given the global continuous rise, artificial light at night is often considered a driving force behind moth population declines. Although negative effects on individuals have been shown, there is no evidence for effects on population sizes to date. Therefore, we compared population trends of Dutch macromoth fauna over the period 1985-2015 between moth species that differ in phototaxis and adult circadian rhythm. We found that moth species that show positive phototaxis or are nocturnally active have stronger negative population trends than species that are not attracted to light or are diurnal species. Our results indicate that artificial light at night is an important factor in explaining declines in moth populations in regions with high artificial night sky brightness. Our study supports efforts to reduce the impacts of artificial light at night by promoting lamps that do not attract insects and reduce overall levels of illumination in rural areas to reverse declines of moth populations.

Date MAR 2018
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:33
Extra Place: Hoboken Publisher: Wiley WOS:000425396700007
Volume 24
Pages 925-932
Publication Global Change Biology
DOI 10.1111/gcb.14008
Issue 3
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

artificial light at night, artificial-light, butterflies, climate, ecological determinants, ecological traits, ecology of the night, extinction, impacts, Lepidoptera, light pollution, noctuid moths, phototaxis, risk, traits, widespread british moths

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Declining growth of deciduous shrubs in the warming climate of continental western Greenland

Type Journal Article
Author Cassandra M. Gamm
Author Patrick F. Sullivan
Author Agata Buchwal

Author Roman J. Dial
Author Amanda B. Young
Author David A. Watts
Author Sean M. P. Cahoon
Author Jeffrey M. Welker
Author Eric Post

Abstract Observational and experimental studies have generally shown that warming is associated with greater growth and abundance of deciduous shrubs in arctic ecosystems. It is uncertain, however, if this trend will persist in the future. Our study examined growth responses of deciduous shrubs to climate change over the late 20th and early 21st centuries near Kangerlussuaq in western Greenland. We combined shrub dendrochronology, stable isotope analysis and weekly measurements of leaf gas exchange to examine the drivers of secondary growth in two widespread and dominant deciduous shrub species: Salix glauca and Betula nana. Betula showed a dramatic growth decline beginning in the early 1990s, when correlations between growing season air temperature and growth shifted from neutral to strongly negative. Salix also showed a growth decline, but it began slightly later and was more pronounced among older stems. May-August mean air temperature of c. 7 degrees C appeared to be an important threshold. Carbon isotope discrimination (Delta C-13) in alpha-cellulose of Salix growth rings declined strongly during the period of reduced growth, suggesting drought-induced stomatal closure as a possible cause. Leaf gas exchange of Salix was also highly sensitive to seasonal variation in moisture availability. Betula growth declined more dramatically than Salix, but leaf gas exchange was less sensitive to moisture availability and there was less evidence of a Delta C-13 trend. We hypothesize that the dramatic Betula growth decline might reflect the combined effects of increasing moisture limitation, repeated defoliation during recent moth outbreaks and greater browsing by a growing muskoxen population. Synthesis. Our findings contrast with widespread observations of increasing shrub growth in the Arctic and instead point to a potential decline in the flux of carbon into a pool with a long mean residence time (wood). While our study area is warmer and drier than much of the Arctic, our results may serve as an early indicator of potential effects of rising temperature in other arctic ecosystems.

Date MAR 2018
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:34
Extra Place: Hoboken Publisher: Wiley WOS:000425046300016
Volume 106
Pages 640-654
Publication Journal of Ecology
DOI 10.1111/1365-2745.12882
Issue 2
Journal Abbr J. Ecol.
ISSN 0022-0477
Date Added 15/03/2023, 14:29:40
Modified 15/03/2023, 14:29:40

Tags:

abundance, Betula nana, betula-nana, c-13, carbon isotope, dendrochronology, expansion, height, herbivory, moisture limitation, plant community responses, Salix glauca, sensitivity, shrub-ring, standardization, stomatal conductance, temperature, tundra

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Declining population trends of European mountain birds

Type Journal Article
Author Aleksi Lehikoinen
Author Lluis Brotons
Author John Calladine
Author Tommaso Campedelli
Author Virginia Escandell
Author Jiri Flousek
Author Christoph Grueneberg
Author Fredrik Haas
Author Sarah Harris
Author Sergi Herrando
Author Magne Husby
Author Frederic Jiguet
Author John Atle Kalas
Author Ake Lindstrom
Author Romain Lorrilliere
Author Blas Molina
Author Clara Pladevall
Author Gianpiero Calvi
Author Thomas Sattler
Author Hans Schmid
Author Paeivi M. Sirkiae
Author Norbert Teufelbauer
Author Sven Trautmann

Abstract Mountain areas often hold special species communities, and they are high on the list of conservation concern. Global warming and changes in human land use, such as grazing pressure and afforestation, have been suggested to be major threats for biodiversity in the mountain areas, affecting species abundance and causing distribution shifts towards mountaintops. Population shifts towards poles and mountaintops have been documented in several areas, indicating that climate change is one of the key drivers of species' distribution changes. Despite the high conservation concern, relatively little is known about the population trends of species in mountain areas due to low accessibility and difficult working conditions. Thanks to the recent improvement of bird monitoring schemes around Europe, we can here report a first account of population trends of 44 bird species from four major European mountain regions: Fennoscandia, UK upland, south-western (Iberia) and south-central mountains (Alps), covering 12 countries. Overall, the mountain bird species declined significantly (-7%) during 2002-2014, which is similar to the declining rate in common birds in Europe during the same period. Mountain specialists showed a significant -10% decline in population numbers. The slope for mountain generalists was also negative, but not significantly so. The slopes of

specialists and generalists did not differ from each other. Fennoscandian and Iberian populations were on average declining, while in United Kingdom and Alps, trends were nonsignificant. Temperature change or migratory behaviour was not significantly associated with regional population trends of species. Alpine habitats are highly vulnerable to climate change, and this is certainly one of the main drivers of mountain bird population trends. However, observed declines can also be partly linked with local land use practices. More efforts should be undertaken to identify the causes of decline and to increase conservation efforts for these populations.

Date FEB 2019
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:10
Extra Place: Hoboken Publisher: Wiley WOS:000456028900016
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DOI 10.1111/gcb.14522
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Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

abundance, afforestation, agriculture, alpine habitat, climate-change, common bird monitoring, community composition, global change, global warming, impact, indicators, land use changes, land-use change, loss of biodiversity, mountains, nitrogen deposition, patterns, population trend, range shifts, upland

Attachments

- Accepted Version

Demographic back-casting reveals that subtle dimensions of climate change have strong effects on population viability

Type Journal Article
Author Kevin Czachura
Author Tom E. X. Miller
Abstract The effects of climate change on population viability reflect the net influence of potentially diverse responses of individual-level demographic processes (growth, survival, regeneration) to multiple components of climate. Articulating climate-demography connections can facilitate forecasts of responses to future climate change as well as back-casts that may reveal how populations responded to historical climate change. We studied climate-demography relationships in the cactusCyclindriopuntia imbricata; previous work indicated that our focal population has high abundance but a negative population growth rate, where deaths exceed

births, suggesting that it persists under extinction debt. We parameterized a climate-dependent integral projection model with data from a 14-year field study, then back-casted expected population growth rates since 1900 to test the hypothesis that recent climate change has driven this population into extinction debt. We found clear patterns of climate change in our central New Mexico study region but, contrary to our hypothesis,C. imbricatahas most likely benefitted from recent climate change and is on track to reach replacement-level population growth within 37 years, or sooner if climate change accelerates. Furthermore, the strongest feature of climate change (a trend towards years that are overall warmer and drier, captured by the first principal component of inter-annual variation) was not the main driver of population responses. Instead, temporal trends in population growth were dominated by more subtle, seasonal climatic factors with relatively weak signals of recent change (wetter and milder cool seasons, captured by the second and third principal components). Synthesis. Our results highlight the challenges of back-casting or forecasting population dynamics under climate change, since the most apparent features of climate change may not be the most important drivers of ecological responses. Environmentally explicit demographic models can help meet this challenge, but they must consider the magnitudes of different aspects of climate change alongside the magnitudes of demographic responses to those changes.

Date	NOV 2020
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:24
Extra	Place: Hoboken Publisher: Wiley WOS:000562570800001
Volume	108
Pages	2557-2570
Publication	Journal of Ecology
DOI	10.1111/1365-2745.13471
Issue	6
Journal Abbr	J. Ecol.
ISSN	0022-0477
Date Added	15/03/2023, 14:29:40
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Tags:

Cactaceae, chihuahuan desert, climate change, demography, dynamics, emperor penguin, extinction debt, integral projection model, long-term ecological research, patterns, plant, precipitation, predict, survival, variability

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Demographic modeling of citizen science data informs habitat preferences and population dynamics of recovering fishes

Type	Journal Article
Author	James T. Thorson
Author	Mark D. Scheuerell
Author	Brice X. Semmens

Author Christy V. Pattengill-Semmens

Abstract Managing natural populations and communities requires detailed information regarding demographic processes at large spatial and temporal scales. This combination is challenging for both traditional scientific surveys, which often operate at localized scales, and recent citizen science designs, which often provide data with few auxiliary information (i.e., no information about individual age or condition). We therefore combine citizen science data at large scales with the demographic resolution afforded by recently developed, site-structured demographic models. We apply this approach to categorical data generated from citizen science representing species density of two managed reef fishes in the Gulf of Mexico, and use a modified Dail-Madsen model to estimate demographic trends, habitat associations, and interannual variability in recruitment. This approach identifies strong preferences for artificial structure for the recovering Goliath grouper, while revealing little evidence of either habitat associations or trends in abundance for mutton snapper. Results are also contrasted with a typical generalized linear mixed-model (GLMM) approach, using real-world and simulated data, to demonstrate the importance of accounting for the statistical complexities implied by spatially structured citizen science data. We conclude by discussing the increasing potential for synthesizing demographic models and citizen science data, and the management benefits that can be accrued.

Date DEC 2014

Language English

Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2

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Journal Abbr Ecology

ISSN 0012-9658

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Tags:

binned count data, challenges, citizen science, counts, Dail-Madsen model, demographic closure, demographic variability, detectability, ecological research, estimating abundance, generalized linear mixed model (GLMM), habitat preferences, inferences, metapopulation, occupancy modeling, opportunistic data, site-structured model, state-space

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Demographic responses underlying eco-evolutionary dynamics as revealed with inverse modelling

Type Journal Article

Author Marjolein Bruijning

Author Eelke Jongejans
Author Martin M. Turcotte

Abstract Changes in population dynamics due to interacting evolutionary and ecological processes are the direct result of responses in vital rates, that is stage-specific growth, survival and fecundity. Quantifying through which vital rates population fitness is affected, instead of focusing on population trends only, can give a more mechanistic understanding of eco-evolutionary dynamics. The aim of this study was to estimate the underlying demographic rates of aphid (Myzus persicae) populations. We analysed unpublished stage-structure population dynamics data of a field experiment with caged and uncaged populations in which rapid evolutionary dynamics were observed, as well as unpublished results from an individual life table experiment performed in a glasshouse. Using data on changes in population abundance and stage distributions over time, we estimated transition matrices with inverse modelling techniques, in a Bayesian framework. The model used to fit across all experimental treatments included density as well as clone-specific caging effects. We additionally used individual life table data to inform the model on survival, growth and reproduction. Results suggest that clones varied considerably in vital rates, and imply trade-offs between reproduction and survival. Responses to densities also varied between clones. Negative density dependence was found in growth and reproduction, and the presence of predators and competitors further decreased these two vital rates, while survival estimates increased. Under uncaged conditions, population growth rates of the evolving populations were increased compared to the expectation based on the pure clones. Our inverse modelling approach revealed how much vital rates contributed to the eco-evolutionary dynamics. The decomposition analysis showed that variation in population growth rates in the evolving populations was to a large extent shaped by plant size. Yet, it also revealed an impact of evolutionary changes in clonal composition. Finally, we discuss that inverse modelling is a complex problem, as multiple combinations of individual rates can result in the same dynamics. We discuss assumptions and limitations, as well as opportunities, of this approach.

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Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
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Extra Place: Hoboken Publisher: Wiley WOS:000471342700010
Volume 88
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Publication Journal of Animal Ecology
DOI 10.1111/1365-2656.12966
Issue 5
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
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Tags:

adaptation, communities, consequences, daphnia-magna, density-dependence, feedback loop, population growth rate, population model, population-dynamics, rapid evolution, sensitivity analysis, temperature, trait, vital rates

Attachments

- Full Text

Deterministic assembly of land snail communities according to species size and diet

Type Journal Article

Author Brandon Schamp
Author Michal Horsak
Author Michal Hajek

Abstract P>1. We investigated whether coexisting snail species in 145 treeless fen communities in the Western Carpathian Mountains differed more in size and diet than would be expected by chance, as predicted for traits commonly associated with competition and differential resource acquisition under limiting similarity theory. 2. Contrary to expectations, coexisting snail species were no more different in body size than expected by chance under a null model. However, variation in body size played a significant role in structuring snail communities: coexisting snail species were significantly more similar with respect to body size. 3. We developed two new test statistics to expand our investigation of limiting similarity to include diet, a nominal trait. We tested whether communities of snails were characterized by a greater richness of diet, and whether different diets were represented more or less evenly within communities. Communities of snails were significantly less evenly distributed than expected by chance, with detritivores being over-represented relative to predatory strategies. 4. We also examined the effect of water pH and conductivity, herbaceous cover, and bryophyte and vascular plant richness, on these trends by examining how the effect size of our tests varied across these gradients. Convergence in species size increased with increasing habitat pH. Specifically, smaller snail species were over-represented in fen communities in general, and this effect was accentuated in increasingly calcareous fens. 5. Theory predicts that traits related strongly to environmental conditions are more likely to be convergent. Our findings support this suggestion, as small snail species have an advantage in tolerating freezing conditions over winter when refuges are limited. 6. These results add to the growing body of literature demonstrating that variation in body size and diet play a strong role in structuring communities, although frequently in ways not predicted by limiting similarity theory. Finally, our results increase our understanding of how species are assembled non-randomly into communities with respect to important traits.

Date JUL 2010
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:38
Extra Place: Hoboken Publisher: Wiley WOS:000278399300009
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Pages 803-810
Publication Journal of Animal Ecology
DOI 10.1111/j.1365-2656.2010.01685.x
Issue 4
Journal Abbr J. Anim. Ecol.

ISSN 0021-8790
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Tags:

body size, body-size, central-european fens, coexistence community assembly, cold-hardiness, competitive ability, diet, different rooting depths, environmental filtering, environmental gradients, limiting similarity, limiting similarity, pH, plant-populations, population-density, shell size, trait convergence, trait dispersion, trait divergence

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Differential plasticity of size and mass to environmental change in a hibernating mammal

Type Journal Article
Author Cindy I. Canale
Author Arpat Ozgul
Author Dominique Allaine
Author Aurelie Cohas
Abstract Morphological changes following changes in species' distribution and phenology have been suggested to be the third universal response to global environmental change. Although structural size and body mass result from different genetic, physiological, and ecological mechanisms, they are used interchangeably in studies evaluating population responses to environmental change. Using a 22-year (1991-2013) dataset including 1768 individuals, we investigated the coupled dynamics of size and mass in a hibernating mammal, the Alpine marmot (Marmota marmota), in response to local environmental conditions. We (i) quantified temporal trends in both traits, (ii) determined the environmental drivers of trait dynamics, and (iii) identified the life-history processes underlying the observed changes. Both phenotypic traits were followed through life: we focused on the initial trait value (juvenile size and mass) and later-life development (annual change in size [Delta size] and mass [Delta mass]). First, we demonstrated contrasting dynamics between size and mass over the study period. Juvenile size and subsequent Dsize showed significant declines, whereas juvenile mass and subsequent Dmass remained constant. As a consequence of smaller size associated with a similar mass, individuals were in better condition in recent years. Second, size and mass showed different sensitivities to environmental variables. Both traits benefited from early access to resources in spring, whereas Dmass, particularly in early life, also responded to summer and winter conditions. Third, the interannual variation in both traits was caused by changes in early life development. Our study supports the importance of considering the differences between size and mass responses to the environment when evaluating the mechanisms underlying population dynamics. The current practice of focusing on only one trait in population modeling can lead to misleading conclusions when evaluating species' resilience to contemporary climate change.
Date OCT 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2

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Volume 22
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Publication Global Change Biology
DOI 10.1111/gcb.13286
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Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

adult body-mass, Alpine marmot, alpine marmots marmota, bergmanns rule, body size, climate change, cohort variation, evolution, food availability, French Alps, global climate-change, normalized difference vegetation index, phenotypic plasticity, population-density, reaction norm, reproductive success, roe deer

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Direct and indirect effects of heatwaves on a coral reef fishery

Type Journal Article
Author Christopher J. Brown
Author Camille Mellin
Author Graham J. Edgar
Author Max D. Campbell
Author Rick D. Stuart-Smith
Abstract Marine heatwaves are increasing in frequency and intensity, and indirectly impacting coral reef fisheries through bleaching-induced degradation of live coral habitats. Marine heatwaves also affect fish metabolism and catchability, but such direct effects of elevated temperatures on reef fisheries are largely unknown. We investigated direct and indirect effects of the devastating 2016 marine heatwave on the largest reef fishery operating along the Great Barrier Reef (GBR). We used a combination of fishery-independent underwater census data on coral trout biomass (Plectropomus and Variola spp.) and catch-per-unit-effort (CPUE) data from the commercial fishery to evaluate changes in the fishery resulting from the 2016 heatwave. The heatwave caused widespread, yet locally patchy, declines in coral cover, but we observed little effect of local coral loss on coral trout biomass. Instead, a pattern of decreasing biomass at northern sites and stable or increasing biomass at southern sites suggested a direct response of populations to the heatwave. Analysis of the fishery-independent data and CPUE found that in-water coral trout biomass estimates were positively related to CPUE, and that coral trout catch rates increased with warmer temperatures. Temperature effects on catch rates were consistent with the thermal affinities of the multiple species contributing to this fishery. Scaling-up the effect of temperature on coral trout catch rates across the region suggests that GBR-wide catches were 18% higher for a given level of effort during the heatwave year relative to catch rates under the mean temperatures in the preceding 6 years. These results highlight a potentially large effect of heatwaves on catch rates of reef fishes, independent of changes in reef habitats, that can add substantial uncertainty to estimates of stock trends inferred from fishery-dependent (CPUE) data.

Overestimation of CPUE could initiate declines in reef fisheries that are currently fully exploited, and threaten sustainable management of reef stocks.

Date	MAR 2021
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:44
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Volume	27
Pages	1214-1225
Publication	Global Change Biology
DOI	10.1111/gcb.15472
Issue	6
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:52:53
Modified	15/03/2023, 14:52:53

Tags:

Bayesian modelling, catchability, climate change, climate-change, coral reef fishery, coral bleaching, coral trout, ecosystem, great-barrier-reef, heatwave, impacts, management, marine reserves, ocean, structural complexity

Attachments

- Accepted Version

Direct evidence of a prey depletion "halo" surrounding a pelagic predator colony

Type	Journal Article
Author	Sam B. Weber
Author	Andrew J. Richardson
Author	Judith Brown
Author	Mark Bolton
Author	Bethany L. Clark
Author	Brendan J. Godley
Author	Eliza Leat
Author	Steffen Oppel
Author	Laura Shearer
Author	Karline E. R. Soetaert
Author	Nicola Weber
Author	Annette C. Broderick
Abstract	Colonially breeding birds and mammals form some of the largest gatherings of apex predators in the natural world and have provided model systems for studying mechanisms of population regulation in animals. According to one influential hypothesis, intense competition for food among large numbers of spatially

constrained foragers should result in a zone of prey depletion surrounding such colonies, ultimately limiting their size. However, while indirect and theoretical support for this phenomenon, known as "Ashmole's halo," has steadily accumulated, direct evidence remains exceptionally scarce. Using a combination of vesselbased surveys and Global Positioning System tracking, we show that pelagic seabirds breeding at the tropical island that first inspired Ashmole's hypothesis do indeed deplete their primary prey species (flying fish; Exocoetidae spp.) over a considerable area, with reduced prey density detectable >150 km from the colony. The observed prey gradient was mirrored by an opposing trend in seabird foraging effort, could not be explained by confounding environmental variability, and can be approximated using a mechanistic consumption-dispersion model, incorporating realistic rates of seabird predation and random prey dispersal. Our results provide a rare view of the resource footprint of a pelagic seabird colony and reveal how aggregations of these central-place foraging, marine top predators profoundly influence the oceans that surround them.

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Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:58
Extra Place: Washington Publisher: Natl Acad Sciences WOS:000685028700004
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Pages e2101325118
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.2101325118
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Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
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Tags:

abundance, Ashmole's halo, ashmoles halo, central-place foraging, competition, fishery, food, impacts, population, predator-prey interaction, seabird, seabirds, size

Attachments

- Full Text

Directionality of recent bird distribution shifts and climate change in Great Britain

Type Journal Article
Author Simon Gillings
Author Dawn E. Balmer
Author Robert J. Fuller
Abstract There is good evidence that species' distributions are shifting poleward in response to climate change and wide interest in the magnitude of such responses for scientific and conservation purposes. It has been suggested from the directions of climatic

changes that species' distribution shifts may not be simply poleward, but this has been rarely tested with observed data. Here, we apply a novel approach to measuring range shifts on axes ranging through 360 degrees, to recent data on the distributions of 122 species of British breeding birds during 1988-1991 and 2008-2011. Although previously documented poleward range shifts have continued, with an average 13.5km shift northward, our analysis indicates this is an underestimate because it ignores common and larger shifts that occurred along axes oriented to the north-west and north-east. Trailing edges contracted from a broad range of southerly directions. Importantly, these results are derived from systematically collected data so confounding observer-effort biases can be discounted.Analyses of climate for the same period show that whilst temperature trends should drive species along a north-north-westerly trajectory, directional responses to precipitation will depend on both the time of year that is important for determining a species' distribution, and the location of the range margin. Directions of species' range centroid shift were not correlated with spatial trends in any single climate variable. We conclude that range shifts of British birds are multidirectional, individualistic and probably determined by species-specific interactions of multiple climate factors. Climate change is predicted to lead to changes in community composition through variation in the rates that species' ranges shift; our results suggest communities could change further owing to constituent species shifting along different trajectories. We recommend more studies consider directionality in climate and range dynamics to produce more appropriate measures of observed and expected responses to climate change.

Date JUN 2015
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
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Volume 21
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Publication Global Change Biology
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Issue 6
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

abundance changes, birds, climate change, directionality, farmland birds, fingerprint, frequency, patterns, poleward shifts, population, precipitation, rainfall, range, range dynamics, range margins, responses, temperature

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Disentangling the effects of multiple environmental drivers on population changes within communities

Type Journal Article
Author Diana E. Bowler

Author Henning Heldbjerg
Author Anthony D. Fox
Author Robert B. O'Hara
Author Katrin Boehning-Gaese

Abstract 1. The effects of different environmental drivers on the changes in species' population abundances can be difficult to disentangle as they often act simultaneously. Researchers have built statistical models that include environmental variables (such as annual temperature) or species attributes (such as a species' temperature preference), which are assumed to detect the impacts of specific drivers (such as climate change). However, these approaches are often applied separately or, if combined, not explicitly compared. 2. We show the complementary insights gained by applying both these approaches to a community dataset on Danish terrestrial birds. We use our analysis to compare the relative importance of climate change and agricultural land-use change for the abundance changes within the community between 1983 and 2013. 3. Population models were fitted to the community data of species' annual abundances with predictors comprising: species attributes (species' temperature and habitat preferences), environmental variables (climatic and agricultural land-use change variables) or both. Relationships between species' abundances and environmental variables were used to identify the drivers associated with average abundance changes of species in the community. Relationships between species' abundances and their attributes were used to understand the drivers causing interspecific variation in abundance changes. 4. Warmer winters were positively associated with community-level abundances, and warm-adapted species had more positive abundance changes than cold-adapted ones. Agricultural land-use area was negatively associated with community-level abundances, and birds using a high proportion of meadow and habitat specialists had more negative abundance changes than birds using other habitats and habitat generalists. Effect sizes of environmental variables were larger for agricultural land-use change while those of species attributes were larger for climate change. 5. The environmental data approach suggested that agricultural land-use change has decreased the average abundances of species in the community, affecting total community size while the species attribute-based approach suggested that climate change has caused variation in abundance among species, affecting community composition. Environmental variables and species attributes that are hypothesized to link to specific drivers can be used together to provide complementary information on the impacts of different drivers on communities.

Date JUL 2018
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:07
Extra Place: Hoboken Publisher: Wiley WOS:000435940700012
Volume 87
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Publication Journal of Animal Ecology
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Issue 4
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
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Tags:

abundance, biodiversity indicators, bird populations, change impacts, climate change, climate-change, community ecology, declines, generalists, land-use change, population trends, specialists, species attributes, trait-based approach, vulnerability

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Disentangling the role of environmental and human pressures on biological invasions across Europe

Type Journal Article
Author Petr Pysek
Author Vojtech Jarosik
Author Philip E. Hulme
Author Ingolf Kuehn
Author Jan Wild
Author Margarita Arianoutsou
Author Sven Bacher
Author Francois Chiron
Author Viktoras Didziulis
Author Franz Essl
Author Piero Genovesi
Author Francesca Gherardi
Author Martin Hejda
Author Salit Kark
Author Philip W. Lambdon
Author Marie-Laure Desprez-Loustau
Author Wolfgang Nentwig
Author Jan Pergl
Author Katja Poboljsaj
Author Wolfgang Rabitsch
Author Alain Roques
Author David B. Roy
Author Susan Shirley
Author Wojciech Solarz
Author Montserrat Vila
Author Marten Winter

Abstract The accelerating rates of international trade, travel, and transport in the latter half of the twentieth century have led to the progressive mixing of biota from across the world and the number of species introduced to new regions continues to increase. The importance of biogeographic, climatic, economic, and demographic factors as drivers of this trend is increasingly being realized but as yet there is no consensus regarding their relative importance. Whereas little may be done to mitigate the effects of geography and climate on invasions, a wider range of options may exist to moderate the impacts of economic and demographic drivers. Here we use the most recent data available from Europe to partition between macroecological, economic, and demographic variables the variation in alien species richness of bryophytes, fungi, vascular plants, terrestrial insects, aquatic invertebrates, fish, amphibians, reptiles, birds, and mammals. Only national wealth and human population density were statistically significant predictors in the majority of models when analyzed jointly with climate, geography, and land cover. The economic and demographic variables reflect the intensity of human activities and integrate the effect of factors that directly determine the outcome of invasion such as propagule pressure, pathways of introduction, eutrophication, and the intensity of anthropogenic disturbance. The strong influence of economic and demographic variables on the levels of invasion by alien species demonstrates that future solutions to the problem of biological invasions at a national scale lie in mitigating the negative environmental consequences of human activities that generate wealth and by promoting more sustainable population growth.

Date	JUL 6 2010
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:26:39
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000279572100023
Volume	107
Pages	12157-12162
Publication	Proceedings of the National Academy of Sciences of the United States of America
DOI	10.1073/pnas.1002314107
Issue	27
Journal Abbr	Proc. Natl. Acad. Sci. U. S. A.
ISSN	0027-8424
Date Added	15/03/2023, 14:27:14
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Tags:

alien plants, climate, economy, exotic plants and animals, geography, introductions, pathways, patterns, plant invasions, prediction, species richness, success, terrestrial, trade, vertebrates

Attachments

- Full Text

Divergent trends in the risk of spring frost damage to trees in Europe with recent warming

Type	Journal Article
Author	Qianqian Ma
Author	Jian-Guo Huang
Author	Heikki Hanninen
Author	Frank Berninger

Abstract Frost events during the active growth period of plants can cause extensive frost damage with tremendous economic losses and dramatic ecological consequences. A common assumption is that climate warming may bring along a reduction in the frequency and severity of frost damage to vegetation. On the other hand, it has been argued that rising temperature in late winter and early spring might trigger the so called "false spring", that is, early onset of growth that is followed by cold spells, resulting in increased frost damage. By combining daily gridded climate data and 1,489 k in situ phenological observations of 27 tree species from 5,565 phenological observation sites in Europe, we show here that temporal changes in the risk of spring frost damage with recent warming vary largely depending on the species and geographical locations. Species whose phenology was especially sensitive to climate warming tended to have increased risk of frost damage. Geographically, compared with continental areas, maritime and coastal areas in Europe were more exposed to increasing occurrence of frost and these late spring frosts were getting more severe in the maritime and coastal areas. Our results suggest that even though temperatures will be elevated in the future, some phenologically responsive species and many populations of a given species will paradoxically experience more frost damage in the future warming climate. More attention should be paid to the increased frost damage in responsive species and populations in maritime areas when developing strategies to mitigate the potential negative impacts of climate change on ecosystems in the near future.

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Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:45
Extra Place: Hoboken Publisher: Wiley WOS:000453370700029
Volume 25
Pages 351-360
Publication Global Change Biology
DOI 10.1111/gcb.14479
Issue 1
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Modified 15/03/2023, 14:52:53

Tags:

budburst, climate change, climate-change, frost damage, onset, patterns, phenology, spring frost, temperate tree, temperatures

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Divergent trophic responses of sympatric penguin species to historic anthropogenic exploitation and recent climate change

Type Journal Article
Author Kelton W. McMahon
Author Chantel I. Michelson
Author Tom Hart
Author Matthew D. McCarthy
Author William P. Patterson
Author Michael J. Polito
Abstract The Southern Ocean is in an era of significant change. Historic overharvesting of marine mammals and recent climatic warming have cascading impacts on resource

availability and, in turn, ecosystem structure and function. We examined trophic responses of sympatric chinstrap (Pygoscelis antarctica) and gentoo (Pygoscelis papua) penguins to nearly 100 y of shared environmental change in the Antarctic Peninsula region using compound-specific stable isotope analyses of museum specimens. A century ago, gentoo penguins fed almost exclusively on low-trophic level prey, such as krill, during the peak of historic overexploitation of marine mammals, which was hypothesized to have resulted in a krill surplus. In the last 40 y, gentoo penguin trophic position has increased a full level as krill declined in response to recent climate change, increased competition from recovering marine mammal populations, and the development of a commercial krill fishery. A shifting isotopic baseline supporting gentoo penguins suggests a concurrent increase in coastal productivity over this time. In contrast, chinstrap penguins exhibited no change in trophic position, despite variation in krill availability over the past century. The specialized foraging niche of chinstrap penguins likely renders them more sensitive to changes in krill availability, relative to gentoo penguins, as evinced by their declining population trends in the Antarctic Peninsula over the past 40 y. Over the next century, similarly divergent trophic and population responses are likely to occur among Antarctic krill predators if climate change and other anthropogenic impacts continue to favor generalist over specialist species.

Date	DEC 17 2019
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:28:19
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000503281500055
Volume	116
Pages	25721-25727
Publication	Proceedings of the National Academy of Sciences of the United States of America
DOI	10.1073/pnas.1913093116
Issue	51
Journal Abbr	Proc. Natl. Acad. Sci. U. S. A.
ISSN	0027-8424
Date Added	15/03/2023, 14:28:28
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Tags:

antarctic peninsula, Antarctica, chinstrap penguins, delta-n-15, density, ecogeochemistry, ecological responses, environmental change, gentoo, historical ecology, krill, krill surplus, populations, sea-ice, southern-ocean

Attachments

- Full Text

Diversity, divergence and density: How habitat and hybrid zone dynamics maintain a genomic cline in an intertidal barnacle

Type	Journal Article

Author John P. Wares
Author Allan E. Strand
Author Erik E. Sotka

Abstract Aim As within-species genomic data have been shown useful in interpreting broader biogeographic trends, we analysed the mode of population genomic isolation involved in a well-studied intertidal genomic cline to better understand the mechanisms maintaining it. These results were interpreted in the context of spatial variation in habitat use and availability as well as likely fitness consequences for hybridization between the two lineages. Location Pacific coast of North America. Taxon Arthropods (Class Maxillopoda, Order Sessilia, Family Balanidae; Balanus glandula). Methods Genotype-by-sequencing approaches were used to generate single-nucleotide polymorphism markers across sites sampled between southern Alaska and Southern California. Inference using standard population genomic methods, including analysis of population structure, inbreeding and linkage disequilibrium, was used to identify the steepest transitions across the largest number of loci examined. These data were put in the context of observed population density and habitat availability. Results We show that the majority of markers analysed show strong clinal transitions in a very narrow portion of the California coast. Patterns of linkage disequilibrium among markers, along with prior evidence of variation in reproductive potential by latitude and by mitochondrial lineage, suggest some reproductive isolation among the northern and southern lineages of B. glandula that are concordant with the drop in population density and habitat availability in central California. Main Conclusions A significant clinal transition in genomic diversity is stronger and more localized than previously recognized and exhibits statistical patterns suggesting that the lineages are reproductively and phenotypically distinct in ways that may be ecologically important. As this species has been used to infer process in coastal biogeography, further study of concordant patterns will be important for advancing our understanding of this region.

Date SEP 2021
Language English
Short Title Diversity, divergence and density
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:25
Extra Place: Hoboken Publisher: Wiley WOS:000665189400001
Volume 48
Pages 2174-2185
Publication Journal of Biogeography
DOI 10.1111/jbi.14142
Issue 9
Journal Abbr J. Biogeogr.
ISSN 0305-0270
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

acorn barnacle, alongshore variation, Balanus glandula, balanus-glandula, barnacles, biological oceanography, California, demography, genetic-structure, genomic clines, geographic range, habitat, larval dispersal, latitudinal variation, local adaptation, mytilus-galloprovincialis, pacific coast, Pacific coast, seascape genetics

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Domesticated honey bees evolutionarily reduce flower nectar volume in a Tibetan lotus

Type	Journal Article
Author	Junpeng Mu
Author	Youhong Peng
Author	Xinqiang Xi
Author	Xinwei Wu
Author	John N. Griffin
Author	Karl J. Niklas
Author	Shucun Sun
Abstract	Plants have evolved costly flowering traits, including the provisioning of rich nectar, to attract and reward their pollinators. Beekeeping (apiculture) locally increases densities of honey bees, which might drive economization of pollinator-attracting traits, but the potential evolutionary consequences of beekeeping on plant-pollinator interactions remain unknown. Here, we present evidence suggesting that intensive apiculture has driven the rapid evolution of plant traits in the alpine lotus (Saussurea nigrescens) on the Tibetan Plateau by allowing reduced nectar volume provisioning without compromising pollination success. This conclusion is supported by measurements of reproductive and vegetative traits, including nectar, at sites of varying distance from apiaries that have housed introduced honey bees (Apis mellifera) since the early 1980s. Nectar volume was more than 60% lower at sites close to apiaries than at more distant sites, while nectar concentration remained consistent. When seedlings from field sites were grown under common garden conditions, trends in nectar volume identical to those in the field were observed, indicating that recently evolved genetic differences likely underlie patterns observed in the field. The adaptive advantage of reduced nectar volume under high pollinator density was clear in both the field and in the common garden. Specifically, plants from sites close to apiaries were taller, had more aboveground biomass, and produced more flowers and seeds compared to those at distant sites, which is consistent with the tradeoffs between nectar volume per flower and flower number per inflorescence within sites. The evolution of reduced nectar volume suggested by our results shows that the widespread practice of beekeeping might be a strong selective agent acting on wild plant populations and illustrates that human activities may indirectly affect evolution by changing critical species interactions.
Date	NOV 2014
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:29
Extra	Place: Hoboken Publisher: Wiley WOS:000345326000016
Volume	95

Pages 3161-3172
Publication Ecology
Issue 11
Journal Abbr Ecology
ISSN 0012-9658
Date Added 15/03/2023, 14:29:40
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Tags:

apiculture, Apis mellifera, ecology, floral traits, honey bee, nectar volume and concentration, patterns, plant, plant-pollinator relationship, polemonium, pollinator visitation, rapid evolution, Saussurea nigrescens, seed production, selection, size, Tibetan Plateau, time

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Drivers of climate change impacts on bird communities

Type Journal Article

Author James W. Pearce-Higgins
Author Sarah M. Eglington
Author Blaise Martay
Author Dan E. Chamberlain

Abstract 1. Climate change is reported to have caused widespread changes to species' populations and ecological communities. Warming has been associated with population declines in long-distance migrants and habitat specialists, and increases in southerly distributed species. However, the specific climatic drivers behind these changes remain undescribed. 2. We analysed annual fluctuations in the abundance of 59 breeding bird species in England over 45 years to test the effect of monthly temperature and precipitation means upon population trends. 3. Strong positive correlations between population growth and both winter and breeding season temperature were identified for resident and short-distance migrants. Lagged correlations between population growth and summer temperature and precipitation identified for the first time a widespread negative impact of hot, dry summer weather. Resident populations appeared to increase following wet autumns. Populations of long-distance migrants were negatively affected by May temperature, consistent with a potential negative effect of phenological mismatch upon breeding success. There was evidence for some nonlinear relationships between monthly weather variables and population growth. 4. Habitat specialists and cold-associated species showed consistently more negative effects of higher temperatures than habitat generalists and southerly distributed species associated with warm temperatures. Results suggest that previously reported changes in community composition represent the accumulated effects of spring and summer warming. 5. Long-term population trends were more significantly correlated with species' sensitivity to temperature than precipitation, suggesting that warming has had a greater impact on population trends than changes in precipitation. Months where there had been the greatest warming were the most influential drivers of long-term change. There was also evidence that species with the greatest sensitivity to extremes of precipitation have tended to decline. 6. Our results provide novel insights about the impact of climate change on bird communities. Significant lagged effects highlight the potential for altered species' interactions to drive observed climate change impacts, although some community changes may have been driven by more immediate responses to warming. In England, resident and short-distance migrant populations have increased in response to climate change, but potentially at

the expense of long-distance migrants, habitat specialists and cold-associated species.

Date JUL 2015
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:01
Extra Place: Hoboken Publisher: Wiley WOS:000357813500007
Volume 84
Pages 943-954
Publication Journal of Animal Ecology
DOI 10.1111/1365-2656.12364
Issue 4
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

biotic homogenization, birds, climate change, community temperature index, community specialization index, density-dependence, migrants, migratory birds, palearctic migrant birds, population declines, population trends, precipitation, range, scale, survival rates, taxonomic homogenization, temperature, thermal tolerances

Attachments

- Submitted Version

Dual impacts of climate change: forest migration and turnover through life history

Type Journal Article
Author Kai Zhu
Author Christopher W. Woodall
Author Souparno Ghosh
Author Alan E. Gelfand
Author James S. Clark
Abstract Tree species are predicted to track future climate by shifting their geographic distributions, but climate-mediated migrations are not apparent in a recent continental-scale analysis. To better understand the mechanisms of a possible migration lag, we analyzed relative recruitment patterns by comparing juvenile and adult tree abundances in climate space. One would expect relative recruitment to be higher in cold and dry climates as a result of tree migration with juveniles located further poleward than adults. Alternatively, relative recruitment could be higher in warm and wet climates as a result of higher tree population turnover with increased temperature and precipitation. Using the USDA Forest Service's Forest Inventory and Analysis data at regional scales, we jointly modeled juvenile and adult abundance distributions for 65 tree species in climate space of the eastern United

States. We directly compared the optimal climate conditions for juveniles and adults, identified the climates where each species has high relative recruitment, and synthesized relative recruitment patterns across species. Results suggest that for 77% and 83% of the tree species, juveniles have higher optimal temperature and optimal precipitation, respectively, than adults. Across species, the relative recruitment pattern is dominated by relatively more abundant juveniles than adults in warm and wet climates. These different abundance-climate responses through life history are consistent with faster population turnover and inconsistent with the geographic trend of large-scale tree migration. Taken together, this juvenile-adult analysis suggests that tree species might respond to climate change by having faster turnover as dynamics accelerate with longer growing seasons and higher temperatures, before there is evidence of poleward migration at biogeographic scales.

Date	JAN 2014
Language	English
Short Title	Dual impacts of climate change
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:48
Extra	Place: Hoboken Publisher: Wiley WOS:000327998600023
Volume	20
Pages	251-264
Publication	Global Change Biology
DOI	10.1111/gcb.12382
Issue	1
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:52:53
Modified	15/03/2023, 14:52:53

Tags:

abundance, biodiversity, biogeography, change vulnerability, climate change, conservation biology, eastern united-states, Forest Inventory and Analysis, ontogenic niche shifts, plant-species distributions, range shift, regeneration niche, seedling, spatial scale, species distribution model, tree, tree migration, tropical rain-forest

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Dynamic macroecology on ecological time-scales

Type	Journal Article
Author	Jonathan A. D. Fisher
Author	Kenneth T. Frank
Author	William C. Leggett
Abstract	Aim The discipline of macroecology is increasingly being regarded as an effective vehicle for the evaluation of recent population- to ecosystem-level responses to widespread human and environmental influences. However, due to the prevalent use of time-averaged and cumulative data in macroecological analyses, the majority of the patterns that emerge from research in this field can be regarded as static. Here

we review the application of dynamic macroecological analyses to changes in relationships between macroecological variables on seasonal to decadal scales. We illustrate the strength of this perspective for documenting changing patterns and testing hypotheses related to these dynamics on ecological time-scales. Location Studies were compiled and reviewed from terrestrial and aquatic ecosystems. Methods We review examples of temporal changes in macroecological patterns driven by recent anthropogenic influences and environmental change. Results The dynamic nature of macroecological patterns on ecological time-scales has been revealed in recent years across a wide range of ecosystems, largely through the development, maintenance and analysis of biotic and environmental monitoring time series. The resultant analyses complement examinations of dynamics over evolutionary time and have similarly revealed that static portrayals can conceal important temporal dynamics that underlie the patterns of interest. As a consequence, static depictions, resting as they do on comparative analyses in which the validity of space-for-time substitutions is assumed, may be of limited use for testing hypotheses related to the mechanisms underlying the patterns revealed and, by extension, the development of reliable predictions of future states. Main conclusions Recent dynamic macroecological analyses have demonstrated the utility of combined spatial and temporal replication, and have contributed to hypothesis testing related to the mechanistic processes underlying changes in macroecological patterns on ecological time-scales. We suggest four specific avenues of future research to further the development and application of temporal approaches on similar time-scales within the field of macroecology.

Date	JAN 2010
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:50
Extra	Place: Hoboken Publisher: Wiley WOS:000272573200001
Volume	19
Pages	1-15
Publication	Global Ecology and Biogeography
DOI	10.1111/j.1466-8238.2009.00482.x
Issue	1
Journal Abbr	Glob. Ecol. Biogeogr.
ISSN	1466-822X
Date Added	15/03/2023, 14:52:53
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Tags:

Abundance, abundance distributions, body size, body-size, butterfly species richness, climate change, climate-change, conservation, extinction risk, fish production, geographical range, human impacts, latitudinal gradients, north-atlantic oscillation, space-for-time substitution, species richness, temporal dynamics, temporal trends, trophic control

Ecological and life-history traits explain recent boundary shifts in elevation and latitude of western North American songbirds

Type Journal Article

Author Sonya K. Auer

Author David I. King

Abstract Aim Species are expected to move uphill or poleward in response to climate change, yet their distributions show idiosyncratic responses; many species are moving in the predicted direction, but others are not shifting at all or are shifting downhill or towards the equator. Fundamental questions remain about the causes of interspecific variation in range responses and whether shifts along elevational and latitudinal gradients are correlated. We examined whether shifts in northern-latitude and upper-elevation boundaries of western North American songbirds over a 35-year period were correlated and whether species ecological and life-history traits explained interspecific variation in observed shifts. Location North America. Methods We used data from the North American Breeding Bird Survey to determine shifts in northern-latitude and upper-elevation boundaries of 40 North American songbird species between two time periods, 1977-81 and 2006-11. We used an analysis of covariance approach that controlled for species population trends and changes in survey effort to test whether: (1) songbirds shifted in elevation, latitude or both; (2) shifts in elevation and latitude were correlated; and (3) responses could be explained by species-level traits including life history, ecological generalization and dispersal capability. Results The majority of species shifted uphill and poleward during this period, but there was no correlation between the distances that species range boundaries shifted in elevation and latitude. Species with smaller clutch sizes and narrower diet breadths exhibited greater northward shifts, while species with larger clutch sizes and narrower diet breadths exhibited greater uphill shifts. Main conclusions Shifts in latitude and elevation were not correlated. However, a common set of species-level traits explained differential responses among species to climate change. Consideration of shifts in both elevation and latitude is needed to understand the full extent to which species are tracking changing climates.

Date AUG 2014

Language English

Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3

Accessed 15/03/2023, 14:52:36

Extra Place: Hoboken Publisher: Wiley WOS:000339110400004

Volume 23

Pages 867-875

Publication Global Ecology and Biogeography

DOI 10.1111/geb.12174

Issue 8

Journal Abbr Glob. Ecol. Biogeogr.

ISSN 1466-822X

Date Added 15/03/2023, 14:52:53

Modified 15/03/2023, 14:52:53

Tags:

aves, birds, climate-change, communities, distributions, Ecological specialization, global climate change, hotspots, life history, phylogeny, range, range shifts, responses, species traits, well

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Ecological legacies of civil war: 35-year increase in savanna tree cover following wholesale large-mammal declines

Type	Journal Article
Author	Joshua H. Daskin
Author	Marc Stalmans
Author	Robert M. Pringle
Abstract	1. Large mammalian herbivores (LMH) exert strong effects on plants in tropical savannas, and many wild LMH populations are declining. However, predicting the impacts of these declines on vegetation structure remains challenging. 2. Experiments suggest that tree cover can increase rapidly following LMH exclusion. Yet it is unclear whether these results scale up to predict ecosystem-level impacts of LMH declines, which often alter fire regimes, trigger compensatory responses of other herbivores and accompany anthropogenic land-use changes. Moreover, theory predicts that grazers and browsers should have opposing effects on tree cover, further complicating efforts to forecast the outcomes of community-wide declines. 3. We used the near-extirpation of grazing and browsing LMH from Gorongosa National Park during the Mozambican Civil War (1977-1992) as a natural experiment to test whether megafaunal collapse increased tree cover. We classified herbaceous and tree cover in satellite images taken (a) at the onset of war in 1977 and (b) in 2012, two decades after hostilities ceased. 4. Throughout the 3620-km(2) park, proportional tree cover increased by 34% (from 0.29 to 0.39) an addition of 362 km(2). Four of the park's five major habitat zones (including miombo woodland, Acacia-Combretum-palm savanna, and floodplain grassland) showed even greater increases in tree cover (51-134%), with an average increase of 94% in ecologically critical Rift Valley habitats. Only in the eastern Cheringoma Plateau, which had historically low wildlife densities, did tree cover decrease (by 5%). 5. The most parsimonious explanation for these results is that reduced browsing pressure enhanced tree growth, survival and/or recruitment; we found no directional trends in rainfall or fire that could explain increased tree cover. 6. Synthesis. Catastrophic large-herbivore die-offs in Mozambique's flagship national park were followed by 35 years of woodland expansion, most severely in areas where pre-war wildlife biomass was greatest. These findings suggest that browsing release supersedes grazer-grass-fire feedbacks in governing ecosystem-level tree cover, consistent with smaller-scale experimental results, although the potentially complementary effect of CO_2 fertilization cannot be definitively ruled out. Future work in Gorongosa will reveal whether recovering LMH populations reverse this trend, or alternatively whether woody encroachment hinders ongoing restoration efforts.
Date	JAN 2016
Language	English
Short Title	Ecological legacies of civil war
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:23
Extra	Place: Hoboken Publisher: Wiley WOS:000368298700009

Volume 104
Pages 79-89
Publication Journal of Ecology
DOI 10.1111/1365-2745.12483
Issue 1
Journal Abbr J. Ecol.
ISSN 0022-0477
Date Added 15/03/2023, 14:29:40
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Tags:

biodiversity loss, bush encroachment, classification, communities, determinants, die-offs, elephants, elephants Loxodonta africana, extinction, fire, forest, herbivore, Hexagon satellite, plant-herbivore interactions, population declines, remote sensing, top-down effects, tree-grass coexistence, trophic cascade, woody cover

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Effects of climate on fall migration phenology of monarch butterflies departing the northeastern breeding grounds in Canada

Type Journal Article
Author Danielle M. M. Ethier
Author Greg W. W. Mitchell
Abstract Monarch butterflies (Danaus plexippus) undergo an iconic multi-generational migration, traveling thousands of kilometers from the summer breeding grounds in southern Canada to overwintering sites in central Mexico. This migration phenomena can be affected by climate change, which may have important implications on fitness and ultimately populations status. We investigated the long-term trends in fall migration phenology of monarchs using a 25-year dataset collected along the coast of Lake Erie in Ontario, Canada. We also investigated local long-term trends in weather covariates that have the potential to influence migration phenology at this site. Patterns in standardized daily counts of monarchs were compared with local weather covariates using two methods (i.e., monthly averages and moving windows) to assess difference in outputs between analytical approaches. Our results suggest that monarch migration timing (migration midpoint, average peak, first peak, and late passage) and weather covariates have been consistent over time, in direct contrast to a similar study in Cape May, New Jersey, which showed a significant increase in both fall temperature and a 16- to 19-day shift in monarch migration timing. Furthermore, our results differed between analytical approaches. With respect to annual variability in air temperature, our monthly average analysis suggested that for each degree increase in September air temperature, late season passage would advance 4.71 days (+/- 1.59 SE, p = .01). However, the moving window analysis suggested that this result is likely spurious and found no significant correlations between migration timing and any weather covariates. Importantly, our results caution against extrapolating the effects of climate change on the migration phenology of the monarch across study regions and the need for more long-term monitoring efforts to better understand regional drivers of variability in migration timing.
Language English
Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:51:17
Extra Place: Hoboken Publisher: Wiley WOS:000916158300001
Publication Global Change Biology
DOI 10.1111/gcb.16579
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:51:19
Modified 15/03/2023, 14:51:19

Tags:

abundance, british butterflies, climate change, conservation, counts, Danaus plexippus, diapause, impacts, insect, migration timing, mismatch, monarch butterfly, photoperiod, population trends, responses, temperature

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Effects of climate on salmonid productivity: A global meta-analysis across freshwater ecosystems

Type Journal Article
Author Brian K. Gallagher
Author Sarah Geargeoura
Author Dylan J. Fraser
Abstract Salmonids are of immense socio-economic importance in much of the world, but are threatened by climate change. This has generated a substantial literature documenting the effects of climate variation on salmonid productivity in freshwater ecosystems, but there has been no global quantitative synthesis across studies. We conducted a systematic review and meta-analysis to gain quantitative insight into key factors shaping the effects of climate on salmonid productivity, ultimately collecting 1321 correlations from 156 studies, representing 23 species across 24 countries. Fisher's Z was used as the standardized effect size, and a series of weighted mixed-effects models were compared to identify covariates that best explained variation in effects. Patterns in climate effects were complex and were driven by spatial (latitude, elevation), temporal (time-period, age-class), and biological (range, habitat type, anadromy) variation within and among study populations. These trends were often consistent with predictions based on salmonid thermal tolerances. Namely, warming and decreased precipitation tended to reduce productivity when high temperatures challenged upper thermal limits, while opposite patterns were common when cold temperatures limited productivity. Overall, variable climate impacts on salmonids suggest that future declines in some locations may be counterbalanced by gains in others. In particular, we suggest that future warming should (1) increase salmonid productivity at high latitudes and elevations (especially >60 degrees and >1500 m), (2) reduce productivity in populations experiencing hotter and dryer growing season conditions, (3) favor non-native over native salmonids, and (4) impact lentic populations less negatively than lotic ones. These patterns should help conservation and management organizations identify populations most vulnerable to climate change, which can then be prioritized for protective measures. Our framework enables broad inferences about future productivity that can inform decision-making under climate change for

salmonids and other taxa, but more widespread, standardized, and hypothesis-driven research is needed to expand current knowledge.

Date	DEC 2022
Language	English
Short Title	Effects of climate on salmonid productivity
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:37
Extra	Place: Hoboken Publisher: Wiley WOS:000865738300001
Volume	28
Pages	7250-7269
Publication	Global Change Biology
DOI	10.1111/gcb.16446
Issue	24
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:52:53
Modified	15/03/2023, 14:52:53

Tags:

abundance, arctic charr, brook trout growth, chinook salmon, coho salmon, cutthroat trout, data synthesis, dwelling brown trout, freshwater fish, growth, juvenile atlantic salmon, population dynamics, population vital-rates, systematic review, thermal habitat use, vendace coregonus-albula

Attachments

- Full Text

Effects of historic and projected climate change on the range and impacts of an emerging wildlife disease

Type	Journal Article
Author	Stephen J. Price
Author	William T. M. Leung
Author	Christopher J. Owen
Author	Robert Puschendorf
Author	Chris Sergeant
Author	Andrew A. Cunningham
Author	Francois Balloux
Author	Trenton W. J. Garner
Author	Richard A. Nichols
Abstract	The global trend of increasing environmental temperatures is often predicted to result in more severe disease epidemics. However, unambiguous evidence that temperature is a driver of epidemics is largely lacking, because it is demanding to demonstrate its role among the complex interactions between hosts, pathogens, and their shared environment. Here, we apply a three-pronged approach to understand

the effects of temperature on ranavirus epidemics in UK common frogs, combining in vitro, in vivo, and field studies. Each approach suggests that higher temperatures drive increasing severity of epidemics. In wild populations, ranavirosis incidents were more frequent and more severe at higher temperatures, and their frequency increased through a period of historic warming in the 1990s. Laboratory experiments using cell culture and whole animal models showed that higher temperature increased ranavirus propagation, disease incidence, and mortality rate. These results, combined with climate projections, predict severe ranavirosis outbreaks will occur over wider areas and an extended season, possibly affecting larval recruitment. Since ranaviruses affect a variety of ectothermic hosts (amphibians, reptiles, and fish), wider ecological damage could occur. Our three complementary lines of evidence present a clear case for direct environmental modulation of these epidemics and suggest management options to protect species from disease.

Date	AUG 2019
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed	15/03/2023, 14:47:08
Extra	Place: Hoboken Publisher: Wiley WOS:000497502700012
Volume	25
Pages	2648-2660
Publication	Global Change Biology
DOI	10.1111/gcb.14651
Issue	8
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:47:34
Modified	15/03/2023, 14:47:34

Tags:

amphibian population decline, behavioral fever, chytridiomycosis, climate change, common frog, ecology, emerging infectious disease, host-pathogen interactions, models, mortality, origin, Rana temporaria, ranavirus, ranavirus infection, susceptibility, temperature, temporaria, virulence

Attachments

- Submitted Version

Effects of two centuries of global environmental variation on phenology and physiology of Arabidopsis thaliana

Type	Journal Article
Author	Victoria L. DeLeo
Author	Duncan N. L. Menge
Author	Ephraim M. Hanks
Author	Thomas E. Juenger

Author Jesse R. Lasky

Abstract Intraspecific trait variation is caused by genetic and plastic responses to environment. This intraspecific diversity is captured in immense natural history collections, giving us a window into trait variation across continents and through centuries of environmental shifts. Here we tested if hypotheses based on life history and the leaf economics spectrum explain intraspecific trait changes across global spatiotemporal environmental gradients. We measured phenotypes on a 216-year time series of Arabidopsis thaliana accessions from across its native range and applied spatially varying coefficient models to quantify region-specific trends in trait coordination and trait responses to climate gradients. All traits exhibited significant change across space or through time. For example, delta N-15 decreased over time across much of the range and leaf C:N increased, consistent with predictions based on anthropogenic changes in land use and atmosphere. Plants were collected later in the growing season in more recent years in many regions, possibly because populations shifted toward more spring germination and summer flowering as opposed to fall germination and spring flowering. When climate variables were considered, collection dates were earlier in warmer years, while summer rainfall had opposing associations with collection date depending on regions. There was only a modest correlation among traits, indicating a lack of a single life history/physiology axis. Nevertheless, leaf C:N was low for summer- versus spring-collected plants, consistent with a life history-physiology axis from slow-growing winter annuals to fast-growing spring/summer annuals. Regional heterogeneity in phenotype trends indicates complex responses to spatiotemporal environmental gradients potentially due to geographic genetic variation and climate interactions with other aspects of environment. Our study demonstrates how natural history collections can be used to broadly characterize trait responses to environment, revealing heterogeneity in response to anthropogenic change.

Date FEB 2020
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
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Extra Place: Hoboken Publisher: Wiley WOS:000498030800001
Volume 26
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Issue 2
Journal Abbr Glob. Change Biol.
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Tags:

abiotic stress, carbon-isotope discrimination, climate, climate change, Delta C-13, drought adaptation, economics spectrum, flowering time, generalized additive-models, generalized additive model, genetic correlations, leaf, phenology, plant nitrogen, water-use efficiency

Attachments

- Submitted Version

Eiders, nutrients and eagles: Bottom-up and top-down population dynamics in a marine bird

Type	Journal Article
Author	Federico Morelli
Author	Karsten Laursen
Author	Marek Svitok
Author	Yanina Benedetti
Author	Anders Pape Moller
Abstract	1. The main objective of this long-term study (1978-2016) was to find the underlying factors behind the declining trends of eider Somateria mollissima in the Baltic/Wadden Sea. 2. Specifically, we aimed at quantifying the bottom-up effect of nutrients, through mussel stocks, on reproduction and abundance of eider, and the top-down effects caused by white-tailed eagle Haliaeetus albicilla predation. 3. Bottom-up effects increase marine primary productivity with subsequent effects on food availability for a major mussel predator. Top-down effects may also regulate eider populations because during incubation female eiders are vulnerable to predation by eagles. 4. Our structural equation modelling explained a large percentage of the variance in eider abundance. We conclude that the Baltic/Wadden Sea eider population was regulated directly by white-tailed sea eagle predation on incubating females and indirectly by the amount of nutrients in seawater affecting both mussel stocks and the breeding success of eiders, reflecting density dependence. 5. These findings may explain the decreasing trend in the Baltic/Wadden Sea eider population during the last decades as an additive effect of top-down and bottom-up factors, and likely as an interaction between them.
Date	AUG 2021
Language	English
Short Title	Eiders, nutrients and eagles
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:27:14
Extra	Place: Hoboken Publisher: Wiley WOS:000653692100001
Volume	90
Pages	1844-1853
Publication	Journal of Animal Ecology
DOI	10.1111/1365-2656.13498
Issue	8
Journal Abbr	J. Anim. Ecol.
ISSN	0021-8790
Date Added	15/03/2023, 14:27:14
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Tags:

body reserves, bottom-up effects, breeding success, common eider, fertilizer, Haliaeetus albicilla, life-history, long-term, marine environments, mussel stocks, nutrients, size, Somateria mollissima, somateria-mollissima, spring migration, wadden sea, winter

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Elevated atmospheric carbon dioxide impairs the performance of root-feeding vine weevils by modifying root growth and secondary metabolites

Type Journal Article

Author Scott N. Johnson
Author Adam T. Barton
Author Katherine E. Clark
Author Peter J. Gregory
Author Lindsay S. McMenemy
Author Robert D. Hancock

Abstract Predicting how insect crop pests will respond to global climate change is an important part of increasing crop production for future food security, and will increasingly rely on empirically based evidence. The effects of atmospheric composition, especially elevated carbon dioxide (eCO(2)), on insect herbivores have been well studied, but this research has focussed almost exclusively on aboveground insects. However, responses of root-feeding insects to eCO(2) are unlikely to mirror these trends because of fundamental differences between aboveground and belowground habitats. Moreover, changes in secondary metabolites and defensive responses to insect attack under eCO(2) conditions are largely unexplored for root herbivore interactions. This study investigated how eCO(2) (700 mu mol mol-1) affected a root-feeding herbivore via changes to plant growth and concentrations of carbon (C), nitrogen (N) and phenolics. This study used the root-feeding vine weevil, Otiorhynchus sulcatus and the perennial crop, Ribes nigrum. Weevil populations decreased by 33% and body mass decreased by 23% (from 7.2 to 5.4 mg) in eCO(2). Root biomass decreased by 16% in eCO(2), which was strongly correlated with weevil performance. While root N concentrations fell by 8%, there were no significant effects of eCO(2) on root C and N concentrations. Weevils caused a sink in plants, resulting in 8-12% decreases in leaf C concentration following herbivory. There was an interactive effect of CO2 and root herbivory on root phenolic concentrations, whereby weevils induced an increase at ambient CO2, suggestive of defensive response, but caused a decrease under eCO(2). Contrary to predictions, there was a positive relationship between root phenolics and weevil performance. We conclude that impaired root-growth underpinned the negative effects of eCO(2) on vine weevils and speculate that the plant's failure to mount a defensive response at eCO(2) may have intensified these negative effects.

Date FEB 2011
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:18
Extra Place: Hoboken Publisher: Wiley WOS:000285878000004
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Publication Global Change Biology
DOI 10.1111/j.1365-2486.2010.02264.x
Issue 2
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

black vine weevil, carbon dioxide, co2 enrichment, herbivore interactions, induced responses, insect, nitrogen, nutrients, otiorhynchus-sulcatus coleoptera, phenolics, plant-growth, responses, roots, secondary metabolites, soil, soils, temperature

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Elk herbivory alters small mammal assemblages in high-elevation drainages

Type Journal Article
Author Elliott W. R. Parsons
Author John L. Maron
Author Thomas E. Martin
Abstract Heavy herbivory by ungulates can substantially alter habitat, but the indirect consequences of habitat modification for animal assemblages that rely on that habitat are not well studied. This is a particularly important topic given that climate change can alter plantherbivore interactions. We explored short-term responses of small mammal communities to recent exclusion of Rocky Mountain elk (Cervus elaphus) in high-elevation riparian drainages in northern Arizona, where elk impacts on vegetation have increased over the past quarter century associated with climate change. We used 10-ha elk exclosures paired with unfenced control drainages to examine how browsing influenced the habitat use, relative abundance, richness and diversity of a small mammal assemblage. We found that the small mammal assemblage changed significantly after 5years of elk exclusion. Relative abundance of voles (Microtus mexicanus) increased in exclosure drainages, likely due to an increase in habitat quality. The relative abundances of woodrats (Neotoma neomexicana) and two species of mice (Peromyscus maniculatus and P.boylii) decreased in the controls, while remaining stable in exclosures. The decline of mice in control drainages was likely due to the decline in shrub cover that they use. Thus, elk exclusion may have maintained or improved habitat for mice inside the exclosures while habitat quality and mouse abundance both declined outside the fences. Finally, small mammal species richness increased in the exclosures relative to the controls while species diversity showed no significant trends. Together, our results show that relaxation of heavy herbivore pressure by a widespread native ungulate can lead to rapid changes in small mammal assemblages. Moreover, exclusion of large herbivores can yield rapid responses by vegetation that may enhance or maintain habitat quality for small mammal populations.
Date MAR 2013
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:12

Extra Place: Hoboken Publisher: Wiley WOS:000315122100018
Volume 82
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Publication Journal of Animal Ecology
DOI 10.1111/1365-2656.12009
Issue 2
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
Date Added 15/03/2023, 14:27:14
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Tags:

Cervus elaphus, climate-change, communities, deer mice, diversity, exclosure, habitat, habitat quality, herbivory, impacts, indirect effects, northern Arizona, population, productivity, responses, Rocky Mountain elk, selection, small mammals, voles, white-tailed deer

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Environment- and trait-mediated scaling of tree occupancy in forests worldwide

Type Journal Article
Author Haibao Ren
Author Petr Keil
Author Xiangcheng Mi
Author Keping Ma
Author Zhanqing Hao
Author Wanhui Ye
Author Luxiang Lin
Author Renato Valencia
Author Christine Dawn Fletcher
Author Duncan W. Thomas
Author Robert W. Howe
Author James Lutz
Author Norman A. Bourg
Author Sheng-Hsin Su
Author I.-Fang Sun
Author Li Zhu
Author Li-Wan Chang
Author Xihua Wang
Author Xiaojun Du
Author David Kenfack
Author George B. Chuyong
Author Walter Jetz
Abstract Aim The relationship between the proportion of sites occupied by a species and the area of a site [occupancy-area relationship (OAR)] offers key information for biodiversity management and has long fascinated ecologists. We quantified the variation in OAR for 3,157 woody species in 17 forest plots worldwide and tested the relative importance of environment and species traits for explaining this

variation and evaluated overall model predictive ability. Location Global. Time period Early 21st century. Major taxa studied Woody plants. Methods We used mixed-effect regression to examine the observed shape of the OAR (its "slope") against species-specific and plot-wide predictors: coarse-grain occupancy, tree size, plot species richness, energy availability and topographic complexity. Results We found large variation in OAR slopes, and the variation was strongest among species within plots. The OAR slopes showed a latitudinal trend and were steeper near the equator. As predicted, coarse-grain occupancy and tree size negatively affected OAR slopes, whereas species richness had a positive effect and explained most of the variance between plots. Although hypothesized directionalities were broadly confirmed, traits and environment had relatively limited overall predictive power. Main conclusions These results document the variation of the OAR for 3,157 species at near-global extent. We found a latitudinal gradient in OAR slopes and confirmed key hypothesized predictors. But at this global extent and over the large set of species analysed, the remaining unexplained variation in OAR slopes was substantial. Nevertheless, this large-scale empirical analysis of the OAR offers an initial step towards a more general use of OARs for the fine-scale prediction of species distributions and abundance.

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Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:47
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Volume	28
Pages	1155-1167
Publication	Global Ecology and Biogeography
DOI	10.1111/geb.12922
Issue	8
Journal Abbr	Glob. Ecol. Biogeogr.
ISSN	1466-822X
Date Added	15/03/2023, 14:52:53
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Tags:

abundance, actual evapotranspiration, beta diversity, biodiversity conservation, community, ecology, Nachman model, negative density-dependence, occupancy-area relationship, patterns, plant diversity, population, scaling, seed dispersal, spatial aggregation, species distributions, topography, tree size

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Environment-triggered demographic changes cascade and compound to propel a dramatic decline of an Antarctic seabird metapopulation

Type	Journal Article
Author	Louise Emmerson
Author	Colin Southwell
Abstract	While seabirds are well-known for making a living under some of the harshest conditions on the planet, their capacity to buffer against unfavourable conditions can be stretched in response to ecosystem change. During population increases, overlap

between conspecifics can limit population growth through competition for breeding or feeding resources. What is less well understood is the role that intrinsic processes play during periods of population decline or under a changing environment. We interrogate key demographic parameters and their biophysical drivers to understand the role of intrinsic and extrinsic drivers during a recent near halving of a large Adelie penguin (Pygoscelis adeliae) metapopulation. The loss of 154,000 breeding birds along the 100-km East Antarctic coastline centred around 63 degrees E over the last decade diverges from a sustained increase over preceding decades and is contrary to recent models that predict a continued increase. The decline was initially triggered by changed environmental conditions: more extensive near-shore sea ice caused a reduction in breeding success. The evidence suggests this decline was exacerbated by feedback processes driving an inverse density-dependent decrease in fledgling survival in response to smaller cohort size. It appears that the old adage of safety in numbers may shape the fledgling penguins' chances of survival and, if compromised over multiple years, could exacerbate difficulties during population decline or if feedback processes arise. The likely interplay between demographic parameters meant that conditions were more unfavourable and negative effects more rapid than would be expected if demographic processes acted in isolation or independently. Failure to capture both intrinsic and extrinsic drivers in predictive population models may mean that the real impacts of climate change on species' populations are more severe than projections would lead us to believe. These results improve our understanding of population regulation during periods of rapid decline for long-lived marine species.

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Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:25
Extra Place: Hoboken Publisher: Wiley WOS:000865422500001
Volume 28
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Publication Global Change Biology
DOI 10.1111/gcb.16437
Issue 24
Journal Abbr Glob. Change Biol.
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Tags:

Antarctica, climate change, climate-change, consequences, density dependence, density-dependence, feedback loop, intrinsic and extrinsic drivers, life-history, penguin response, population change, population-density, pygoscelis-adeliae, southern-ocean, survival, trends

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Evaluating compositional changes in the avian communities of eastern North America using temperature and precipitation indices

Type Journal Article

Author Shannon R. Curley
Author Lisa L. Manne
Author Jose R. Ramirez-Garofalo
Author Richard R. Veit

Abstract Aim Species distributions are altered by climate change, resulting in changes in community composition. How communities are changing with climate is important for understanding the dynamics of changing diversity patterns. In this study, we employ two community weighted means (CWMs) of temperature (CTI) and precipitation (CPI) to evaluate patterns in climate-driven community changes. Location Eastern North America between -100 degrees and -60 degrees longitude and 25 degrees-50 degrees N latitude. Taxon North American birds Methods We used North American Breeding Bird Survey (BBS) data from 1990 to 2018 to test the spatiotemporal trends of these indices at a sub-continental (across all BBS routes) and at a regional scale (sub-continental scale partitioned by 5 degrees latitude bands). We employ a jackknife analysis to highlight individual species contributions to CTI and CPI trends and further identify group characteristics of species based on relative abundance trends and range expansion and contraction trends. Results Across all BBS routes, temperature marginally increased and precipitation significantly increased. At the sub-continental scale, we found no correlation between CTI and temperature, but a positive correlation between CPI and precipitation. CTI and CPI both increased, driven by increased abundances of "warm" and "wet" dwelling species expanding in range. Regional scale CTI and CPI patterns deviated from sub-continental patterns. CTI was driven by "warm" dwelling species increasing in abundance and expanding in range, whereas decreases in "dry" dwelling species contracting in range drove CPI trends at the highest latitudes. Main conclusions The concurrent use of CTI and CPI highlights that community dynamics are more complicated than using temperature metrics alone. Employing more than one community index demonstrates how simultaneous increases in two separate evaluative indices can have disproportionate effects on the number of species that contribute to a trend and highlight disparate mechanisms that contribute to these underlying differences.

Date APR 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
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Extra Place: Hoboken Publisher: Wiley WOS:000770386800001
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Journal Abbr J. Biogeogr.
ISSN 0305-0270
Date Added 15/03/2023, 14:27:14
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Tags:

abundance, birds, Breeding Bird Survey, climate change, climate-change, community ecology, Community Precipitation Index, community science, Community Temperature Index, community weighted means, decline, generalists, host, mycoplasmal conjunctivitis, population, richness, shifts

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Extreme climatic events and vegetation: the role of stabilizing processes

Type Journal Article
Author Francisco Lloret
Author Adrian Escudero
Author Jose Maria Iriondo
Author Jordi Martinez-Vilalta
Author Fernando Valladares
Abstract Current climatic trends involve both increasing temperatures and climatic variability, with extreme events becoming more frequent. Increasing concern on extreme climatic events has triggered research on vegetation shifts. However, evidences of vegetation shifts resulting from these events are still relatively rare. Empirical evidence supports the existence of stabilizing processes minimizing and counteracting the effects of these events, reinforcing community resilience. We propose a demographic framework to understand this inertia to change based on the balance between adult mortality induced by the event and enhanced recruitment or adult survival after the event. The stabilizing processes potentially contributing to this compensation include attenuation of the adult mortality caused by the event, due to site quality variability, to tolerance, phenotypic variability, and plasticity at population level, and to facilitative interactions. Mortality compensation may also occur by increasing future survival due to beneficial effect on growth and survival of the new conditions derived from global warming and increased climatic variability, to lowered competition resulting from reduced density in affected stands, or to antagonistic release when pathogens or predators are vulnerable to the event or the ongoing climatic conditions. Finally, mortality compensation may appear by enhanced recruitment due to release of competition with established vegetation, for instance as a consequence of gap openings after event-caused mortality, or to the new conditions, which may be more favorable for seedling establishment, or to enhanced mutualistic interactions (pollination, dispersal). There are important challenges imposed by the need of long-term studies, but a research agenda focused on potentially stabilizing processes is well suited to understand the variety of responses, including lack of sudden changes and community inertia that are frequently observed in vegetation under extreme events. This understanding is crucial for the establishment of sound management strategies and actions addressed to improve ecosystem resilience under climate change scenarios.
Date MAR 2012
Language English
Short Title Extreme climatic events and vegetation
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
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Extra Place: Hoboken Publisher: Wiley WOS:000300671600001
Volume 18
Pages 797-805

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DOI 10.1111/j.1365-2486.2011.02624.x
Issue 3
Journal Abbr Glob. Change Biol.
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Tags:

biodiversity, climate change, drought, extreme climatic events, forest, forest dieback, global-change, growth, induced tree mortality, plant community resilience, ponderosa pine, productivity, scots pine, shifts, vegetation dynamics

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Extreme climatic events reduce ocean productivity and larval supply in a tropical reef ecosystem

Type Journal Article
Author Alain Lo-Yat
Author Stephen D. Simpson
Author Mark Meekan
Author Davi D. Lecchini
Author Elodie Martinez
Author Rene Galzin
Abstract Increasing ocean temperatures due to global warming are predicted to have negative effects on coral reef fishes. El Nino events are associated with elevated water temperatures at large spatial (1000s of km) and temporal (annual) scales, providing environmental conditions that enable temperature effects on reef fishes to be tested directly. We compared remote sensing data of sea surface temperature (SST) anomalies, surface current flow and chlorophyll-a (Chl-a) concentration with monthly patterns in larval supply of coral reef fishes in nearshore waters around Rangiroa Atoll (French Polynesia) from January 1996 to March 2000. This time included an intense El Nino (April 1997-May 1998) event between two periods of La Nina (January-March 1996 and August 1998-March 2000) conditions. There was a strong relationship between the timing of the El Nino event, current flow, ocean productivity (as measured by Chl-a) and larval supply. In the warm conditions of the event, there was an increase in the SST anomaly index up to 3.5 degrees C above mean values and a decrease in the strength of the westward surface current toward the reef. These conditions coincided with low concentrations of Chl-a (mean: 0.06 mg m-3, SE +/- 0.004) and a 51% decline in larval supply from mean values. Conversely, during strong La Nina conditions when SST anomalies were almost 2 degrees C below mean values and there was a strong westward surface current, Chl-a concentration was 150% greater than mean values and larval supply was 249% greater. A lag in larval supply suggested that productivity maybe affecting both the production of larvae by adults and larval survival. Our results suggest that warming temperatures in the world's oceans will have negative effects on the reproduction of reef fishes and survival of their larvae within the plankton, ultimately impacting on the replenishment of benthic populations.
Date APR 2011
Language English

Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
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Extra Place: Hoboken Publisher: Wiley WOS:000287853000016
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Publication Global Change Biology
DOI 10.1111/j.1365-2486.2010.02355.x
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Tags:

chlorophyll-a, climate, coral reefs, current, El Nino, el-nino, enso, fish larvae, fish larvae, La Nina, larval supply, life-history, long-term trends, mortality, pacific, patterns, recruitment success, settlement, sst, survival rates, variability

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Extreme drought pushes stream invertebrate communities over functional thresholds

Type Journal Article

Author Thomas W. H. Aspin
Author Kieran Khamis
Author Thomas J. Matthews
Author Alexander M. Milner
Author Matthew J. O'Callaghan
Author Mark Trimmer
Author Guy Woodward
Author Mark E. Ledger

Abstract Functional traits are increasingly being used to predict extinction risks and range shifts under long-term climate change scenarios, but have rarely been used to study vulnerability to extreme climatic events, such as supraseasonal droughts. In streams, drought intensification can cross thresholds of habitat loss, where marginal changes in environmental conditions trigger disproportionate biotic responses. However, these thresholds have been studied only from a structural perspective, and the existence of functional nonlinearity remains unknown. We explored trends in invertebrate community functional traits along a gradient of drought intensity, simulated over 18 months, using mesocosms analogous to lowland headwater streams. We modelled the responses of 16 traits based on a priori predictions of trait filtering by drought, and also examined the responses of trait profile groups (TPGs) identified via hierarchical cluster analysis. As responses to drought intensification were both linear and nonlinear, generalized additive models (GAMs) were chosen to model response curves, with the slopes of fitted splines used to detect functional thresholds during drought. Drought triggered significant responses in 12 (75%) of the a priori-selected traits. Behavioural traits describing movement (dispersal, locomotion) and diet were sensitive to moderate-intensity drought, as channels fragmented into isolated pools. By comparison, morphological and physiological traits showed little response until surface water was lost, at which point we observed sudden shifts in body size, respiration mode and thermal tolerance. Responses varied widely among TPGs, ranging from population collapses of non-aerial dispersers as channels fragmented to irruptions of small, eurythermic dietary generalists upon extreme dewatering. Our study demonstrates for the first time that relatively small changes in drought intensity can trigger disproportionately large functional shifts in stream communities, suggesting that traits-based approaches could be particularly useful for diagnosing catastrophic ecological responses to global change.

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Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
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Volume	25
Pages	230-244
Publication	Global Change Biology
DOI	10.1111/gcb.14495
Issue	1
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:52:53
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Tags:

aquatic macroinvertebrates, assemblage responses, benthic-macroinvertebrates, biological traits, climate change, disturbance, disturbance gradient, drought, ecological threshold, ecological thresholds, functional traits, life-history, macroinvertebrates, resilience, species traits, stream drying, temporary rivers

Attachments

- Full Text

Fine-root traits are linked to species dynamics in a successional plant community

Type	Journal Article

Author	Joshua S. Caplan
Author	Scott J. Meiners
Author	Habacuc Flores-Moreno
Author	M. Luke McCormack

Abstract Despite the importance of fine roots for the acquisition of soil resources such as nitrogen and water, the study of linkages between traits and both population and community dynamics remains focused on aboveground traits. We address this gap by investigating associations between belowground traits and metrics of species dynamics. Our analysis included 85 species from a long-term data set on the transition from old field to forest in eastern North America (the Buell-Small Succession Study) and the new Fine-Root Ecology Database. Given the prominent roles of life form (woody vs. non-woody) and species origin (native vs. exotic) in defining functional relationships, we also assessed whether traits or their relationships with species dynamics differed for these groups. Species that reached their peak abundance early in succession had fine-root traits corresponding to resource acquisitive strategies (i.e., they were thinner, less dense, and had higher nitrogen concentrations) while species that peaked progressively later had increasingly conservative strategies. In addition to having more acquisitive root traits than native species, exotics diverged from the above successional trend, having consistently thinner fine roots regardless of the community context. Species with more acquisitive fine-root morphologies typically had faster rates of abundance increase and achieved their maximal rates in fewer years. Decreasing soil nutrient availability and increasing belowground competition may become increasingly strong filters in successional communities, acting on root traits to promote a transition from acquisitive to conservative foraging. However, disturbances that increase light and soil resource availability at local scales may allow acquisitive species, especially invasive exotics, to continue colonizing late into the community transition to forest.

Date	MAR 2019
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:19
Extra	Place: Hoboken Publisher: Wiley WOS:000460163500023
Volume	100
Pages	e02588
Publication	Ecology
DOI	10.1002/ecy.2588
Issue	3
Journal Abbr	Ecology
ISSN	0012-9658
Date Added	15/03/2023, 14:29:40
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Tags:

economics spectrum, ecosystems, functional traits, history, invasive plants, leaf, nutrient foraging strategies, patterns, resources, root diameter, root nitrogen content, root tissue density, soil, species dynamics, species invasions, specific root length, successional dynamics

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Fine-scale population dynamics in a marine fish species inferred from dynamic state-space models

Type	Journal Article
Author	Lauren A. Rogers
Author	Geir O. Storvik
Author	Halvor Knutsen

Author Esben M. Olsen
Author Nils C. Stenseth

Abstract 1. Identifying the spatial scale of population structuring is critical for the conservation of natural populations and for drawing accurate ecological inferences. However, population studies often use spatially aggregated data to draw inferences about population trends and drivers, potentially masking ecologically relevant population sub-structure and dynamics. 2. The goals of this study were to investigate how population dynamics models with and without spatial structure affect inferences on population trends and the identification of intrinsic drivers of population dynamics (e.g. density dependence). 3. Specifically, we developed dynamic, age-structured, state-space models to test different hypotheses regarding the spatial structure of a population complex of coastal Atlantic cod (Gadus morhua). Data were from a 93-year survey of juvenile (age 0 and 1) cod sampled along > 200 km of the Norwegian Skagerrak coast. We compared two models: one which assumes all sampled cod belong to one larger population, and a second which assumes that each fjord contains a unique population with locally determined dynamics. Using the best supported model, we then reconstructed the historical spatial and temporal dynamics of Skagerrak coastal cod. 4. Cross-validation showed that the spatially structured model with local dynamics had better predictive ability. Furthermore, posterior predictive checks showed that a model which assumes one homogeneous population failed to capture the spatial correlation pattern present in the survey data. The spatially structured model indicated that population trends differed markedly among fjords, as did estimates of population parameters including density-dependent survival. Recent biomass was estimated to be at a near-record low all along the coast, but the finer scale model indicated that the decline occurred at different times in different regions. Warm temperatures were associated with poor recruitment, but local changes in habitat and fishing pressure may have played a role in driving local dynamics. 5. More generally, we demonstrated how state-space models can be used to test evidence for population spatial structure based on survey time-series data. Our study shows the importance of considering spatially structured dynamics, as the inferences from such an approach can lead to a different ecological understanding of the drivers of population declines, and fundamentally different management actions to restore populations.

Date JUL 2017
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:08
Extra Place: Hoboken Publisher: Wiley WOS:000403146400018
Volume 86
Pages 888-898
Publication Journal of Animal Ecology
DOI 10.1111/1365-2656.12678
Issue 4
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
Date Added 15/03/2023, 14:28:28
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Tags:

age-structured model, Bayesian modelling, coastal atlantic cod, density-dependence, fisheries management, Gadus morhua, gadus-morhua, genetic differentiation, local-populations, north-sea cod, Norway, observation error, population dynamics, Skagerrak, spatial scale, spatial structure, state-space models, stock, time series, time-series

Attachments

- Full Text

Fire type and hemisphere determine the effects of fire on the alpha and beta diversity of vertebrates: a global meta-analysis

Type Journal Article

Author Louise A. Pastro
Author Christopher R. Dickman
Author Mike Letnic

Abstract AimWe conducted a quantitative meta-analysis to investigate the responses of vertebrate diversity to fire, controlling for variables such as fire type, taxon and ecoregion to identify trends across studies and locations. LocationWorld-wide. MethodsWe calculated indices of the difference in species richness (alpha diversity) and species composition (beta diversity) between burnt and unburnt habitats from studies reporting the species richness and assemblage composition of amphibians, reptiles, birds and mammals. We used a hierarchical approach to investigate the effects of fire on alpha and beta diversity. We tested first for the main effect of fire before investigating the potential influence of fire type (wildfire/prescribed burn), taxon, ecoregion and geographical location (hemisphere/continent). ResultsOne hundred and four studies were evaluated: 56 studies on birds, 26 on mammals, 17 on reptiles and 5 on amphibians. The studies fell into 14 ecoregions, with the three most common being temperate broadleaf and mixed forests, temperate grasslands and savannas and shrublands, and temperate coniferous forest. The effect of fire on species richness and community assemblage composition was strongly influenced by fire type. Prescribed burns significantly increased alpha diversity, whereas wildfires had no overall effect. However, wildfire increased the alpha diversity of temperate coniferous birds in North America. The effects of fire on alpha diversity were stronger in the Northern than the Southern Hemisphere. Turnover in species assemblages (beta diversity) was influenced primarily by fire type. Species assemblages in burnt and unburnt habitats were more similar after prescribed burns and generated lower levels of beta diversity than did wildfires. Main conclusionsThe divergent effects of wildfires and prescribed fires on the alpha and beta diversity of vertebrates and the disparate responses of vertebrate diversity to fires in the Northern and Southern Hemisphere suggest that there is no general response of vertebrate diversity to fire. Our results provide little support for the patch mosaic burn theory or the intermediate disturbance hypothesis to predict post-fire responses of vertebrate diversity.

Date OCT 2014

Language English

Short Title Fire type and hemisphere determine the effects of fire on the alpha and beta diversity of vertebrates

Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:46:58
Extra Place: Hoboken Publisher: Wiley WOS:000341821400009
Volume 23
Pages 1146-1156
Publication Global Ecology and Biogeography
DOI 10.1111/geb.12195
Issue 10
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

Alpha diversity, beta diversity, biodiversity conservation, bird, habitat, impacts, landscapes, meta-analysis, populations, predation, prescribed burn, reptile responses, severity, vertebrates, wildfire

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Fluctuations in population composition dampen the impact of phenotypic plasticity on trait dynamics in superb fairy-wrens

Type Journal Article
Author Martijn van de Pol
Author Helen L. Osmond
Author Andrew Cockburn
Abstract 1. In structured populations, phenotypic change can result from changes throughout an individuals lifetime (phenotypic plasticity, age-related changes), selection and changes in population composition (environment- or density-driven fluctuations in age-structure). 2. The contribution of population dynamics to phenotypic change has often been ignored. However, for understanding trait dynamics, it is important to identify both the individual- and population-level mechanisms responsible for trait change, because they potentially reinforce or counteract each other. 3. We use 22 years of field data to investigate the dynamics of a sexually selected phenological trait, the timing of nuptial moult in superb fairy-wrens Malurus cyaneus. 4. We show that trait expression is both climate-and age-dependent, but that phenotypic plasticity in response to climate variability also varies with age. Old males can acquire nuptial plumage very early after high rainfall, but 1- to 2-year-olds cannot. However, males of all ages that defer moult to later in the year acquire nuptial plumage earlier when conditions are warmer. 5. The underlying mechanism appears to be that old males may risk moulting in the most challenging period of the year: in autumn, when drought restricts food abundance and during the cold winter. By contrast, young males always moult during the spring transition to benign - warmer and generally wetter - conditions. Temperature changes dominate this transition that heralds the breeding season, thereby causing both young and late-moulting older birds to be temperature sensitive. 6. Climate and age also affect trait dynamics via a population dynamical pathway. The same high rainfall that triggers early moulting in old males concurrently increases offspring recruitment and thereby reduces the average age of males in the population. Consequently, effects of rainfall on trait dynamics through phenotypic plasticity of old males are dampened by synchronous rejuvenation of the age-structure. 7. A long-term trend towards drier environments

prompted phenotypic change because of plasticity, but this was masked by climate-driven demographic change (causing apparent stasis). This suggests a novel explanation for why trait change may fail to reflect the observed pattern of directional selection or phenotypic plasticity.

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Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:17
Extra	Place: Hoboken Publisher: Wiley WOS:000300502600012
Volume	81
Pages	411-422
Publication	Journal of Animal Ecology
DOI	10.1111/j.1365-2656.2011.01919.x
Issue	2
Journal Abbr	J. Anim. Ecol.
ISSN	0021-8790
Date Added	15/03/2023, 14:29:40
Modified	15/03/2023, 14:29:40

Tags:

age, age-related improvement, age-structured population, climate change, climate-change, clutch size, directional selection, evolution, heritable size traits, maintenance, Malurus cyaneus, moulting, parameters, phenology, population dynamics, rain, responses, sexually selection, time-to-event model, trait stasis

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Forest microclimate and composition mediate long-term trends of breeding bird populations

Type	Journal Article
Author	Hankyu Kim
Author	Brenda C. McComb
Author	Sarah J. K. Frey
Author	David M. Bell
Author	Matthew G. Betts

Abstract Climate change is contributing to biodiversity redistributions and species declines. However, cooler microclimate conditions provided by old-growth forest structures compared with surrounding open or younger forests have been hypothesized to provide thermal refugia for species that are sensitive to climate warming and dampen the negative effects of warming on population trends of animals (i.e., the microclimate buffering hypothesis). In addition to thermal refugia, the compositional and structural diversity of old-growth forest vegetation itself may provide resources to species that are less available in forests with simpler structure (i.e., the insurance hypothesis). We used 8 years of breeding bird abundance data from a forested watershed, accompanied with sub-canopy temperature data, and ground- and LiDAR-based vegetation data to test these hypotheses and identify factors influencing bird population changes from 2011 to 2018. After accounting for imperfect detection, we found that for 5 of 20 bird species analyzed, abundance trends tended to be less negative or neutral at sites with cooler microclimates, which supports the microclimate buffering hypothesis. Negative effects of warming on two species were also reduced in locations with greater forest compositional diversity supporting the insurance hypothesis. We provide the first empirical evidence that complex forest structure and vegetation diversity confer microclimatic advantages to some animal populations in the face of climate change. Conservation of old-growth forests, or their characteristics in managed forests, could help slow the negative effects of climate warming on some breeding bird populations via microclimate buffering and possibly insurance effects.

Date NOV 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:15
Extra Place: Hoboken Publisher: Wiley WOS:000850148900001
Volume 28
Pages 6180-6193
Publication Global Change Biology
DOI 10.1111/gcb.16353
Issue 21
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

abundance, Andrews Experimental Forest, biodiversity, biodiversity conservation, climate refugia, climate-change, dynamics, extinction, forest ecosystem, global warming, h, insurance, j, long-term ecological research, migratory songbird, old-growth forests, pacific-northwest, redundancy hypothesis, responses

Attachments

- Full Text

Four decades of climatic fluctuations and fish recruitment stability across a marine-freshwater gradient

Type Journal Article
Author Denise D. Colombano
Author Stephanie M. Carlson
Author James A. Hobbs
Author Albert Ruhi
Abstract Investigating the effects of climatic variability on biological diversity, productivity, and stability is key to understanding possible futures for ecosystems under accelerating climate change. A critical question for estuarine ecosystems is, how does climatic variability influence juvenile recruitment of different fish species and life histories that use estuaries as nurseries? Here we examined spatiotemporal

abundance trends and environmental responses of 18 fish species that frequently spend the juvenile stage rearing in the San Francisco Estuary, CA, USA. First, we constructed multivariate autoregressive state-space models using age-0 fish abundance, freshwater flow (flow), and sea surface temperature data (SST) collected over four decades. Next, we calculated coefficients of variation (CV) to assess portfolio effects (1) within and among species, life histories (anadromous, marine opportunist, or estuarine dependent), and the whole community; and (2) within and among regions of the estuary. We found that species abundances varied over space and time (increasing, decreasing, or dynamically stable); and in 83% of cases, in response to environmental conditions (wet/dry, cool/warm periods). Anadromous species responded strongly to flow in the upper estuary, marine opportunist species responded to flow and/or SST in the lower estuary, and estuarine dependent species had diverse responses across the estuary. Overall, the whole community when considered across the entire estuary had the lowest CV, and life histories and species provided strong biological insurance to the portfolio (2.4- to 3.5-fold increases in stability, respectively). Spatial insurance also increased stability, although to a lesser extent (up to 1.6-fold increases). Our study advances the notion that fish recruitment stability in estuaries is controlled by biocomplexity-life history diversity and spatiotemporal variation in the environment. However, intensified drought and marine heatwaves may increase the risk of multiple consecutive recruitment failures by synchronizing species dynamics and trajectories via Moran effects, potentially diminishing estuarine nursery function.

Date	SEP 2022
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:04
Extra	Place: Hoboken Publisher: Wiley WOS:000811898500001
Volume	28
Pages	5104-5120
Publication	Global Change Biology
DOI	10.1111/gcb.16266
Issue	17
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

biocomplexity, biological insurance, california, drought, fisheries, hydroclimate, marine heatwave, nursery, nursery habitat, pelagic fishes, population-dynamics, portfolio effect, san-francisco estuary, state-space models, temperature, time-series, trends, variability

Attachments

- Full Text

Frequency and intensity of productivity regime shifts in marine fish stocks

Type	Journal Article
Author	Katyana A. Vert-pre
Author	Ricardo O. Amoroso
Author	Olaf P. Jensen
Author	Ray Hilborn
Abstract	Fish stocks fluctuate both in abundance and productivity (net population increase), and there are many examples demonstrating that productivity increased or decreased due to changes in abundance caused by fishing and, alternatively, where productivity shifted between low and high regimes, entirely unrelated to abundance. Although shifts in productivity regimes have been described, their frequency and intensity have not previously been assessed. We use a database of trends in harvest and abundance of 230 fish stocks to evaluate the proportion of fish stocks in which productivity is primarily related to abundance vs. those that appear to manifest regimes of high or low productivity. We evaluated the statistical support for four hypotheses: (i) the abundance hypothesis, where production is always related to population abundance; (ii) the regimes hypothesis, where production shifts irregularly between regimes that are unrelated to abundance; (iii) the mixed hypothesis, where even though production is related to population abundance, there are irregular changes in this relationship; and (iv) the random hypothesis, where production is random from year to year. We found that the abundance hypothesis best explains 18.3% of stocks, the regimes hypothesis 38.6%, the mixed hypothesis 30.5%, and the random hypothesis 12.6%. Fisheries management agencies need to recognize that irregular changes in productivity are common and that harvest regulation and management targets may need to be adjusted whenever productivity changes.
Date	JAN 29 2013
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:26:59
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000314558100045
Volume	110
Pages	1779-1784
Publication	Proceedings of the National Academy of Sciences of the United States of America
DOI	10.1073/pnas.1214879110
Issue	5
Journal Abbr	Proc. Natl. Acad. Sci. U. S. A.
ISSN	0027-8424
Date Added	15/03/2023, 14:27:14
Modified	15/03/2023, 14:27:14

Tags:

covariation, dynamics, exploitation rate, fish productivity, gulf, management strategies, multiple stable states, paradigm, patterns, population dynamics, recruitment, regime change, surplus production models, survival

Attachments

- Full Text

General spatial spectral variation in rocky intertidal communities from three biogeographical regions

Type Journal Article

Author Eliseo Fica
Author Eliecer Rodrigo Diaz
Author Nelson Valdivia

Abstract Aim: Understanding general spatial patterns of multiple species is a central aim of biogeography. Spatial analyses of coastal marine assemblages have shown an emergent pattern in that the variability in population abundances increases with increasing spatial scale of observation; i.e. a "red" spectrum of variation in population abundances. However, the generalization of these patterns to other ecological levels and across biogeographical regions remains unexplored. Here, we evaluate the consistency of a reddened relationship between the scale of observation and the variance in ecosystem properties in sessile intertidal rocky-shore assemblages across three biogeographical regions. Location: Replicate sites located in temperate (southern-central Chile), sub-Antarctic (Chilean South Patagonia) and Antarctic (West Antarctic Peninsula) regions. Methods: A total of 16,225 photo-quadrants were used to analyse local patterns of total community cover, bare substratum, total algal cover and total invertebrate cover. We used spectral analyses in which the spatial variance of each property was decomposed along a gradient of increasing distances between observations. Cross-semivariograms were used to analyse the spatial covariation of dominant taxa. Results: The analysed ecosystem properties showed a general reddened spectrum of variation that resembled patchy configurations of local communities. Additionally, cross-semivariance analyses indicated mainly negative relationships of covariation between the abundances dominant sessile species at each site, suggesting a general trend of spatial asynchrony between competing species. Main conclusions: To the best of our knowledge, this is the first study showing a general reddened pattern of spatial variation in relevant ecosystem-level properties across the Pacific shore of South America, southern Patagonia and West Antarctic Peninsula. These patterns reflect the result of multiple biotic and abiotic processes that interact across spatial scales. In particular, we suggest that processes that generate spatial asynchrony between competing species, such as compensatory dynamics, are relevant to maintain the spatial structure of rocky-shore communities.

Date OCT 2017
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:18
Extra Place: Hoboken Publisher: Wiley WOS:000412074300017
Volume 44
Pages 2354-2364
Publication Journal of Biogeography
DOI 10.1111/jbi.13041
Issue 10

Journal Abbr J. Biogeogr.
ISSN 0305-0270
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Tags:

benthic communities, biogeographical gradient, cross-semivariogram, ecological-systems, ecosystem stability, filter feeders, heterogeneity, invasion resistance, macroalgae, mussel perna-perna, patch size, patchiness, patterns, red spectrum, spatial noise, species-diversity, spectral density, variability

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Global climate change increases risk of crop yield losses and food insecurity in the tropical Andes

Type Journal Article
Author Richard Tito
Author Heraldo L. Vasconcelos
Author Kenneth J. Feeley
Abstract One of the greatest current challenges to human society is ensuring adequate food production and security for a rapidly growing population under changing climatic conditions. Climate change, and specifically rising temperatures, will alter the suitability of areas for specific crops and cultivation systems. In order to maintain yields, farmers may be forced to change cultivation practices, the timing of cultivation, or even the type of crops grown. Alternatively, farmers can change the location where crops are cultivated (e.g., to higher elevations) to track suitable climates (in which case the plants will have to grow in different soils), as cultivated plants will otherwise have to tolerate warmer temperatures and possibly face novel enemies. We simulated these two last possible scenarios (for temperature increases of 1.3 degrees C and 2.6 degrees C) in the Peruvian Andes through a field experiment in which several traditionally grown varieties of potato and maize were planted at different elevations (and thus temperatures) using either the local soil or soil translocated from higher elevations. Maize production declined by 21%-29% in response to new soil conditions. The production of maize and potatoes declined by >87% when plants were grown under warmer temperatures, mainly as a result of the greater incidence of novel pests. Crop quality and value also declined under simulated migration and warming scenarios. We estimated that local farmers may experience severe economic losses of up to 2,300 US$ ha(-1) yr(-1). These findings reveal that climate change is a real and imminent threat to agriculture and that there is a pressing need to develop effective management strategies to reduce yield losses and prevent food insecurity. Importantly, such strategies should take into account the influences of non-climatic and/or biotic factors (e.g., novel pests) on plant development.
Date FEB 2018
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:35
Extra Place: Hoboken Publisher: Wiley WOS:000423994700018
Volume 24

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Publication Global Change Biology
DOI 10.1111/gcb.13959
Issue 2
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

agricultural production, change adaptation, future climatic scenarios, global warming, herbivores, herbivory, maize, novel interactions, Peru, pests, potato, responses, security, shifts, small-scale agriculture, temperature, trends

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Global population trajectories of tunas and their relatives

Type Journal Article
Author Maria Jose Juan-Jorda
Author Iago Mosqueira
Author Andrew B. Cooper
Author Juan Freire
Author Nicholas K. Dulvy
Abstract Tunas and their relatives dominate the world's largest ecosystems and sustain some of the most valuable fisheries. The impacts of fishing on these species have been debated intensively over the past decade, giving rise to divergent views on the scale and extent of the impacts of fisheries on pelagic ecosystems. We use all available age-structured stock assessments to evaluate the adult biomass trajectories and exploitation status of 26 populations of tunas and their relatives (17 tunas, 5 mackerels, and 4 Spanish mackerels) from 1954 to 2006. Overall, populations have declined, on average, by 60% over the past half century, but the decline in the total adult biomass is lower (52%), driven by a few abundant populations. The trajectories of individual populations depend on the interaction between life histories, ecology, and fishing pressure. The steepest declines are exhibited by two distinct groups: the largest, longest lived, highest value temperate tunas and the smaller, short-lived mackerels, both with most of their populations being overexploited. The remaining populations, mostly tropical tunas, have been fished down to approximately maximum sustainable yield levels, preventing further expansion of catches in these fisheries. Fishing mortality has increased steadily to the point where around 12.5% of the tunas and their relatives are caught each year globally. Overcapacity of these fisheries is jeopardizing their long-term sustainability. To guarantee higher catches, stabilize profits, and reduce collateral impacts on marine ecosystems requires the rebuilding of overexploited populations and stricter management measures to reduce overcapacity and regulate threatening trade.
Date DEC 20 2011
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2

Accessed	15/03/2023, 14:28:04
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000298289400078
Volume	108
Pages	20650-20655
Publication	Proceedings of the National Academy of Sciences of the United States of America
DOI	10.1073/pnas.1107743108
Issue	51
Journal Abbr	Proc. Natl. Acad. Sci. U. S. A.
ISSN	0027-8424
Date Added	15/03/2023, 14:28:28
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Tags:

abundance, decline, fisheries, management, ocean, pacific, patterns, predators, trends

Attachments

- Full Text

Global signal of top-down control of terrestrial plant communities by herbivores

Type	Journal Article
Author	Shihong Jia
Author	Xugao Wang
Author	Zuoqiang Yuan
Author	Fei Lin
Author	Ji Ye
Author	Zhanqing Hao
Author	Matthew Scott Luskin
Abstract	The theory of "top-down" ecological regulation predicts that herbivory suppresses plant abundance, biomass, and survival but increases diversity through the disproportionate consumption of dominant species, which inhibits competitive exclusion. To date, these outcomes have been clear in aquatic ecosystems but not on land. We explicate this discrepancy using a meta-analysis of experimental results from 123 native animal exclusions in natural terrestrial ecosystems (623 pairwise comparisons). Consistent with top-down predictions, we found that herbivores significantly reduced plant abundance, biomass, survival, and reproduction (all $P < 0.01$) and increased species evenness but not richness ($P = 0.06$ and $P = 0.59$, respectively). However, when examining patterns in the strength of top-down effects, with few exceptions, we were unable to detect significantly different effect sizes among biomes, based on local site characteristics (climate or productivity) or study characteristics (study duration or exclosure size). The positive effects on diversity were only significant in studies excluding large animals or located in temperate grasslands. The results demonstrate that top-down regulation by herbivores is a pervasive process shaping terrestrial plant communities at the global scale, but its strength is highly site specific and not predicted by basic site conditions. We suggest that including herbivore densities as a covariate in future exclosure studies will facilitate the discovery of unresolved macroecology trends in the strength of herbivore-plant interactions.
Date	JUN 12 2018

Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:02
Extra Place: Washington Publisher: Natl Acad Sciences WOS:000434933400052
Volume 115
Pages 6237-6242
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.1707984115
Issue 24
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
Date Added 15/03/2023, 14:28:28
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Tags:

defaunation, density-dependent predation, diversity depends, ecological cascades, ecological impacts, experimental animal exclusion, meta-analysis, metaanalysis, population-control, productivity, resource control, savanna, species composition, species diversity, trophic cascades

Attachments

- Full Text

Global weather and local butterflies: variable responses to a large-scale climate pattern along an elevational gradient

Type Journal Article
Author Nicholas A. Pardikes
Author Arthur M. Shapiro
Author Lee A. Dyer
Author Matthew L. Forister
Abstract Understanding the spatial and temporal scales at which environmental variation affects populations of plants and animals is an important goal for modern population biology, especially in the context of shifting climatic conditions. The El Nino Southern Oscillation (ENSO) generates climatic extremes of interannual variation, and has been shown to have significant effects on the diversity and abundance of a variety of terrestrial taxa. However, studies that have investigated the influence of such large-scale climate phenomena have often been limited in spatial and taxonomic scope. We used 23 years (1988-2010) of a long-term butterfly monitoring data set to explore associations between variation in population abundance of 28 butterfly species and variation in ENSO-derived sea surface temperature anomalies (SSTA) across 10 sites that encompass an elevational range of 2750 m in the Sierra Nevada mountain range of California. Our analysis detected a positive, regional effect of increased SSTA on butterfly abundance (wetter and warmer years predict more butterfly observations), yet the influence of SSTA on butterfly abundances varied along the elevational gradient, and also differed greatly among the 28 species.

Migratory species had the strongest relationships with ENSO-derived SSTA, suggesting that large-scale climate indices are particularly valuable for understanding biotic-abiotic relationships of the most mobile species. In general, however, the ecological effects of large-scale climatic factors are context dependent between sites and species. Our results illustrate the power of long-term data sets for revealing pervasive yet subtle climatic effects, but also caution against expectations derived from exemplar species or single locations in the study of biotic-abiotic interactions.

Date NOV 2015
Language English
Short Title Global weather and local butterflies
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:24
Extra Place: Hoboken Publisher: Wiley WOS:000365521600005
Volume 96
Pages 2891-2901
Publication Ecology
DOI 10.1890/15-0661.1
Issue 11
Journal Abbr Ecology
ISSN 0012-9658
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Tags:

abundance, biotic-abiotic interactions, butterflies, climate change, diversity, dynamics, El Nino Southern Oscillation (ENSO), el-nino, elevational gradient, generalized linear mixed model (GLMM), impacts, migratory taxa, north-atlantic oscillation, rainfall, snowpack, trends, variability

Attachments

- Submitted Version

Habitat availability and ontogenetic shifts alter bottlenecks in size-structured fish populations

Type Journal Article

Author Ariane Cantin
Author John R. Post

Abstract For species that utilize different habitats throughout their life cycle, the habitat limitation at a given stage can act as a bottleneck on population abundance, impacting density-dependent processes such as individual growth and survival. We explore the influence of habitat limitation on population dynamics by developing a multi-stage population model based on lake-dwelling rainbow trout (Oncorhynchus mykiss) populations where adults occupy the lake habitat but use tributaries for spawning and juvenile rearing. The model details density-dependent ecological processes and ontogenetic habitat shifts, harvest mortality, and the impact of climate on growth. We ran model simulations using a range of early life stage habitat availabilities and climatic conditions representative of the native range of rainbow trout in Canada and compared the results to empirical data. The results suggest that (1) increases in early life stage habitat leads to increases in population abundance but, due to density-dependent processes, also results in slower growing stunted populations; (2) population bottlenecks can occur at any life stage, even at the adult stage if spawning and rearing habitats are abundant; (3) when the level of competition for early life stages is increased, inter-cohort competition can lead to population cycles. The model's conclusions are further reinforced by empirical data showing a similar trend in the relationship between fish density and maximum size and providing evidence that limited early life stage habitat leads to lower fish densities and larger fish size. We provide a model that links environmental conditions to population dynamics and is useful for fisheries management and habitat conservation decisions.

Date JUL 2018
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
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Extra Place: Hoboken Publisher: Wiley WOS:000436869900014
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Publication Ecology
DOI 10.1002/ecy.2371
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Tags:

brown trout, demographic bottleneck, density dependence, density-dependent growth, food abundance, habitat limitation, habitat use, juvenile steelhead trout, lake district stream, multi-stage population model, Oncorhynchus mykiss, oncorhynchus-mykiss, ontogenetic niche shifts, population bottlenecks, population dynamics, rainbow-trout, rearing habitat, size-structured populations, spawning habitat, territory size, trout salmo-trutta

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Hiding from the climate: Characterizing microrefugia for boreal forest understory species

Type Journal Article
Author Caroline Greiser
Author Johan Ehrlen
Author Eric Meineri
Author Kristoffer Hylander

Abstract Climate warming is likely to shift the range margins of species poleward, but fine-scale temperature differences near the ground (microclimates) may modify these range shifts. For example, cold-adapted species may survive in microrefugia when the climate gets warmer. However, it is still largely unknown to what extent cold microclimates govern the local persistence of populations at their warm range margin. We located 99 microrefugia, defined as sites with edge populations of 12 widespread boreal forest understory species (vascular plants, mosses, liverworts and lichens) in an area of ca. 24,000 km(2) along the species' southern range margin in central Sweden. Within each population, a logger measured temperature eight times per day during one full year. Using univariate and multivariate analyses, we examined the differences of the populations' microclimates with the mean and range of microclimates in the landscape, and identified the typical climate, vegetation and topographic features of these habitats. Comparison sites were drawn from another logger data set (n = 110), and from high-resolution microclimate maps. The microrefugia were mainly places characterized by lower summer and autumn maximum temperatures, late snow melt dates and high climate stability. Microrefugia also had higher forest basal area and lower solar radiation in spring and autumn than the landscape average. Although there were common trends across northern species in how microrefugia differed from the landscape average, there were also interspecific differences and some species contributed more than others to the overall results. Our findings provide biologically meaningful criteria to locate and spatially predict potential climate microrefugia in the boreal forest. This opens up the opportunity to protect valuable sites, and adapt forest management, for example, by keeping old-growth forests at topographically shaded sites. These measures may help to mitigate the loss of genetic and species diversity caused by rear-edge contractions in a warmer climate.

Date FEB 2020
Language English
Short Title Hiding from the climate
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
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Publication Global Change Biology
DOI 10.1111/gcb.14874
Issue 2
Journal Abbr Glob. Change Biol.
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Tags:

cold-adapted species, fine-grain, genetic-variation, landscape ecology, marginal populations, microclimate, range contraction, range edge, range shift, range shifts, rear edge, refugia, responses, stepping-stones, thermal niche, vegetation

Attachments

- Full Text

Hierarchical modelling and estimation of abundance and population trends in metapopulation designs

Type	Journal Article
Author	Marc Kery
Author	J. Andrew Royle
Abstract	P>1. Population assessment in changing environments is challenging because factors governing abundance may also affect detectability and thus bias observed counts. We describe a hierarchical modelling framework for estimating abundance corrected for detectability in metapopulation designs, where observations of 'individuals' (e.g. territories) are replicated in space and time. We consider two classes of models; first, we regard the data as independent binomial counts and model abundance and detectability based on a product-binomial likelihood. Secondly, we use the more complex detection-non-detection data for each territory to form encounter history frequencies, and analyse the resulting multinomial/Poisson hierarchical model. Importantly, we extend both models to directly estimate population trends over multiple years. Our models correct for any time trends in detectability when assessing population trends in abundance. 2. We illustrate both models for a farmland and a woodland bird species, skylark Alauda arvensis and willow tit Parus montanus, by applying them to Swiss BBS data, where 268 1 km2 quadrats were surveyed two to three times during 1999-2003. We fit binomial and multinomial mixture models where log(abundance) depended on year, elevation, forest cover and transect route length, and logit(detection) on year, season and search effort. 3. Parameter estimates were very similar between models with confidence intervals overlapping for most parameters. Trend estimates were similar for skylark (-0.074 +/- 0.041 vs. -0.047 +/- 0.019) and willow tit (0.044 +/- 0.046 vs. 0.047 +/- 0.018). As expected, the multinomial model gave more precise estimates, but also yielded lower abundance estimates for the skylark. This may be due to effects of territory misclassification (lumping error), which do not affect the binomial model. 4. Both models appear useful for estimating abundance and population trends free from distortions by detectability in metapopulation designs with temporally replicated observations. The ability to obtain estimates of abundance and population trends that are unbiased with respect to any time trends in detectability ought to be a strong motivation for the collection of replicate observation data.
Date	MAR 2010
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
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Extra	Place: Hoboken Publisher: Wiley WOS:000274321200018
Volume	79
Pages	453-461
Publication	Journal of Animal Ecology
DOI	10.1111/j.1365-2656.2009.01632.x
Issue	2
Journal Abbr	J. Anim. Ecol.

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Tags:

animal abundance, Bayesian, counts, hierarchical model, mixture-models, Poisson GLMM, population dynamics, population trends, WinBUGS

How well do we know species richness in a well-known continent? Temporal patterns of endemic and widespread species descriptions in the European fauna

Type Journal Article
Author Franz Essl
Author Wolfgang Rabitsch
Author Stefan Dullinger
Author Dietmar Moser
Author Norbert Milasowszky
Abstract Aim To analyse if the historical species description process in 10 animal groups differed among widespread and endemic species and to evaluate whether our current knowledge about the diversity of these groups is complete. Location Sixty-nine terrestrial regions (countries, large islands, archipelagos) covering all of Europe. Methods Based on data from the Fauna Europaea project, we reconstructed the description histories of four vertebrate groups (amphibians, fish, mammals, reptiles) and six well-studied invertebrate groups (butterflies, grasshoppers, ground beetles, snails, spiders, true bugs) living in terrestrial and freshwater environments. We used accelerated failure time models to test for a possible delay of endemic species detection and to provide conservative estimates of the as yet undescribed proportions of the existing diversity. Results Our data set includes 24,092 species, of which 7202 (30%) are endemic to one Fauna Europaea region. Species descriptions over time follow different trajectories for endemic and widespread species, with endemic species being described 79 years later than widespread ones, on average. Rates of widespread species descriptions have been low throughout the 20th century despite increasing numbers of active taxonomists, and models indicate that only a minor fraction of extant species is unknown (0.43%). By contrast, endemic species accumulation curves do not seem to have levelled off yet. Conservative model predictions suggest that up to 19% of the existing endemic diversity still awaits description in some taxonomic groups. Conclusions Our results suggest that even for well-studied groups in the world's biogeographically best-known continent, scientific knowledge of species richness is far from complete and is biased towards widespread species. Research and conservation priorities may thus be misdirected, as, for example, regions with high numbers of as yet unrecognized endemics may not be adequately considered when setting conservation priorities. This is particularly problematic as their mostly small populations make endemic species especially vulnerable to human-induced pressures.
Date JAN 2013
Language English
Short Title How well do we know species richness in a well-known continent?
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1

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Volume 22
Pages 29-39
Publication Global Ecology and Biogeography
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Issue 1
Journal Abbr Glob. Ecol. Biogeogr.
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Tags:

Accelerated failure time, beetles, climate-change, coleoptera, conservation, conservation biogeography, cumulative species numbers, diversity, Europe, extinctions, Fauna Europaea, global assessment, history, plant, research effort, risk, species descriptions, taxonomy, temporal trends

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Hydrologic variability contributes to reduced survival through metamorphosis in a stream salamander

Type Journal Article

Author Winsor H. Lowe
Author Leah K. Swartz
Author Brett R. Addis
Author Gene E. Likens

Abstract Changes in the amount, intensity, and timing of precipitation are increasing hydrologic variability in many regions, but we have little understanding of how these changes are affecting freshwater species. Stream-breeding amphibians-a diverse group in North America-may be particularly sensitive to hydrologic variability during aquatic larval and metamorphic stages. Here, we tested the prediction that hydrologic variability in streams decreases survival through metamorphosis in the salamander Gyrinophilus porphyriticus, reducing recruitment to the adult stage. Using a 20-y dataset from Merrill Brook, a stream in northern New Hampshire, we show that abundance of G. porphyriticus adults has declined by similar to 50% since 1999, but there has been no trend in larval abundance. We then tested whether hydrologic variability during summers influences survival through metamorphosis, using capture-mark-recapture data from Merrill Brook (1999 to 2004) and from 4 streams in the Hubbard Brook Experimental Forest (2012 to 2014), also in New Hampshire. At both sites, survival through metamorphosis declined with increasing variability of stream discharge. These results suggest that hydrologic variability reduces the demographic resilience and adaptive capacity of G. porphyriticus populations by decreasing recruitment of breeding adults. They also provide insight on how increasing hydrologic variability is affecting freshwater species, and on the broader effects of environmental variability on species with vulnerable metamorphic stages.

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Extra Place: Washington Publisher: Natl Acad Sciences WOS:000487532900054
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Pages 19563-19570
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.1908057116
Issue 39
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
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Tags:

amphibian decline, availability, climate change, climate-change projections, demography, drought, dynamics, ecology, fresh-water ecosystems, headwater streams, impacts, long-term monitoring, Plethodontidae, population-growth, responses

Attachments

- Full Text

Identifying mechanisms underlying individual body size increases in a changing, highly seasonal environment: The growing trout of West brook

Type Journal Article

Author Benjamin H. Letcher
Author Keith H. Nislow
Author Matthew J. O'Donnell
Author Andrew R. Whiteley
Author Jason A. Coombs
Author Todd L. Dubreuil
Author Daniel B. Turek

Abstract As air temperature increases, it has been suggested that smaller individual body size may be a general response to climate warming. However, for ectotherms inhabiting cold, highly seasonal environments, warming temperatures may increase the scope for growth and result in larger body size. In a long-term study of individual brook trout Salvelinus fontinalis and brown trout Salmo trutta inhabiting a small stream network, individual lengths increased over the course of 15 years. As size-selective gains and losses to the population acted to reduce body sizes and mean body size at first tagging in the autumn (<60 mm) were not observed to change substantially over time, the increase in body size was best explained by higher individual growth rates. For brook trout, increasing water temperatures during the spring (when both trout species accomplish most of their total annual growth) was the primary driver of growth rate for juvenile fish and the environmental factor which best explained increases in individual body size over time. For brown trout, by contrast, reduction in and subsequent elimination of juvenile Atlantic salmon Salmo salar midway through the study period explained most of the increases in juvenile growth and body size. In addition to these major trends, a considerable amount of interannual variation in trout growth and body size was explained by other abiotic (stream flow) and biotic (population density) factors with the direction and magnitude of these effects differing by season, age-class and species. For example, stream flow was the dominant growth rate driver for adult fish with strong positive effects in the summer and autumn, but flow variation could not explain increases in body size as we observed no trend in flow. Overall, our work supports the general contention that for high-latitude ectotherms, increasing spring temperatures associated with a warming climate can result in increased growth and individual body size (up to a point), but context-dependent change in other factors can substantially contribute to both interannual variation and longer-term effects.

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Language English
Short Title Identifying mechanisms underlying individual body size increases in a changing, highly seasonal environment
Library Catalogue Web of Science Nextgen
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Issue 1
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Tags:

Atlantic salmon, brook trout, brown trout, climate, climate change, fish invasions, habitat use, life-history, patterns, population vital-rates, salmon salmo-salar, salvelinus-fontinalis, stream ecology, stream flow, stream temperature, young atlantic salmon

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Impact of pollen resources drift on common bumblebees in NW Europe

Type Journal Article
Author Nathalie Roger
Author Romain Moerman
Author Luisa Gigante Carvalheiro
Author Jesus Aguirre-Guitierrez
Author Anne-Laure Jacquemart
Author David Kleijn
Author Georges Lognay
Author Laura Moquet

Author Muriel Quinet
Author Pierre Rasmont
Author Aurore Richel
Author Maryse Vanderplanck
Author Denis Michez

Abstract Several bee species are experiencing significant population declines. As bees exclusively rely on pollen for development and survival, such declines could be partly related to changes in their host plant abundance and quality. Here, we investigate whether generalist bumblebee species, with stable population trends over the past years, adapted their diets in response to changes in the distribution and chemical quality of their pollen resources. We selected five common species of bumblebee in NW Europe for which we had a precise description of their pollen diet through two time periods ('prior to 1950' and '2004-2005'). For each species, we assessed whether the shift in their pollen diet was related with the changes in the suitable area of their pollen resources. Concurrently, we evaluated whether the chemical composition of pollen resources changed over time and experimentally tested the impact of new major pollen species on the development of B. terrestris microcolonies. Only one species (i.e. B. lapidarius) significantly included more pollen from resources whose suitable area expanded. This opportunist pattern could partly explain the expansion of B. lapidarius in Europe. Regarding the temporal variation in the chemical composition of the pollen diet, total and essential amino acid contents did not differ significantly between the two time periods while we found significant differences among plant species. This result is driven by the great diversity of resources used by bumblebee species in both periods. Our bioassay revealed that the shift to new major pollen resources allowed microcolonies to develop, bringing new evidence on the opportunist feature of bumblebee in their diets. Overall, this study shows that the response to pollen resource drift varies among closely related pollinators, and a species-rich plant community ensures generalist species to select a nutrient-rich pollen diet.

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URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
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Extra Place: Hoboken Publisher: Wiley WOS:000390218300007
Volume 23
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Tags:

bombus-terrestris, bumblebee, choice, climate surfaces, database, diet performance, floral resources, food choices, honeybees, hymenoptera, land-use change, nutritive-value, patterns, pollen, preferences, survival

Impacts of climate on prey abundance account for fluctuations in a population of a northern wader at the southern edge of its range

Type Journal Article

Author James W. Pearce-Higgins
Author Peter Dennis
Author Mark J. Whittingham
Author Derek W. Yalden

Abstract Understanding the mechanisms by which climate change will affect animal populations is vital for adaptive management. Many studies have described changes in the timing of biological events, which can produce phenological mismatch. Direct effects on prey abundance might also be important, but have rarely been studied. We examine the likely importance of variation in prey abundance in driving the demographics of a European golden plover (Pluvialis apricaria) population at its southern range margin. Previous studies have correlated plover productivity with the abundance of their adult cranefly (Tipulidae) prey, and modelled the phenology of both plover breeding and cranefly emergence in relation to temperature. Our analyses demonstrate that abundance of adult craneflies is correlated with August temperature in the previous year. Correspondingly, changes in the golden plover population are negatively correlated with August temperature 2 years earlier. Predictions of annual productivity, based on temperature-mediated reductions in prey abundance, closely match observed trends. Modelled variation in annual productivity for a future scenario of increasing August temperatures predicts a significant risk of extinction of the golden plover population over the next 100 years, depending upon the magnitude of warming. Direct effects of climate warming upon cranefly populations may therefore cause northward range contractions of golden plovers, as predicted by climate envelope modelling. Craneflies are an important food source for many northern and upland birds, and our results are likely to have wide relevance to these other species. Research into the potential for habitat management to improve the resilience of cranefly populations to high temperature should be an urgent priority.

Date JAN 2010
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
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Extra Place: Malden Publisher: Wiley-Blackwell Publishing, Inc WOS:000274419200002
Volume 16
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DOI 10.1111/j.1365-2486.2009.01883.x
Issue 1
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

adaptation, bird, climate change, cranefly, density-dependence, dynamics, European golden plover, habitat selection, moorland, peatlands, phenology, plover pluvialis-apricaria, Pluvialis apricaria, reproduction, temperature, tipulidae, Tipulidae

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Implications of nonrandom seed abscission and global stilling for migration of wind-dispersed plant species

Type Journal Article

Author Sally E. Thompson

Author Gabriel G. Katul

Abstract Migration of plant populations is a potential survival response to climate change that depends critically on seed dispersal. Biological and physical factors determine dispersal and migration of wind-dispersed species. Recent field and wind tunnel studies demonstrate biological adaptations that bias seed release toward conditions of higher wind velocity, promoting longer dispersal distances and faster migration. However, another suite of international studies also recently highlighted a global decrease in near-surface wind speeds, or global stilling'. This study assessed the implications of both factors on potential plant population migration rates, using a mechanistic modeling framework. Nonrandom abscission was investigated using models of three seed release mechanisms: (i) a simple drag model; (ii) a seed deflection model; and (iii) a wear and tear' model. The models generated a single functional relationship between the frequency of seed release and statistics of the near-surface wind environment, independent of the abscission mechanism. An Inertial-Particle, Coupled Eulerian-Lagrangian Closure model (IP-CELC) was used to investigate abscission effects on seed dispersal kernels and plant population migration rates under contemporary and potential future wind conditions (based on reported global stilling trends). The results confirm that nonrandom seed abscission increased dispersal distances, particularly for light seeds. The increases were mitigated by two physical feedbacks: (i) although nonrandom abscission increased the initial acceleration of seeds from rest, the sensitivity of the seed dispersal to this initial condition declined as the wind speed increased; and (ii) while nonrandom abscission increased the mean dispersal length, it reduced the kurtosis of seasonal dispersal kernels, and thus the chance of long-distance dispersal. Wind stilling greatly reduced the modeled migration rates under biased seed release conditions. Thus, species that require high wind velocities for seed abscission could experience threshold-like reductions in dispersal and migration potential if near-surface wind speeds continue to decline.

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DOI 10.1111/gcb.12173

Issue 6

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Tags:

anemochory, climate, global stilling, Lagrangian modeling, long-distance dispersal, model, particles, release, seed abscission, seed dispersal, trends, turbulence, variability, vegetation, velocity

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Inadvertent consequences of fishing: the case of the sex-changing shrimp

Type Journal Article
Author Isabelle M. Cote
Abstract The Hokkai shrimp Pandalus latirostris starts life as a male, but eventually turns into a female given the right size and social conditions. The traps used in the fishery targeting this species selectively retain the larger females, leaving a severely male-biased sex ratio in nature and social conditions that bear no resemblance to those that prompted (or prevented) sex change. Photo: Susumu Chiba Chiba, S., Yoshino, K., Kanaiwa, M., Kawajiri, T. & Goshima, S. (2013) Maladaptive sex ratio adjustment by a sex-changing shrimp in selective fishing environments. Journal of Animal Ecology, 82, 631640. Fishing can have many unintended consequences. In this issue, Chiba etal. () demonstrate that size-selective harvesting of a sex-changing shrimp effectively voids their normally adaptive adjustments to population sex ratio. The shrimp's decision' to change sex depends largely on the relative abundance of mature males and females in early summer, before fishing begins. However, fishing traps selectively retain females, leading to heavily male-biased sex ratios at the onset of autumn breeding that are different from the ratios that influenced sex-change decisions. Although this phenomenon is not yet expressed in catch trends, maladaptive sex-change decisions could ultimately affect population productivity and persistence.
Date MAY 2013
Language English
Short Title Inadvertent consequences of fishing
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URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:03
Extra Place: Hoboken Publisher: Wiley-Blackwell WOS:000317863400001
Volume 82
Pages 495-497
Publication Journal of Animal Ecology
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Issue 3
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Tags:

animals, cascades, conservation, dynamics, growth, populations, selective harvest, size

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Inconsistent patterns of body size evolution in co-occurring island reptiles

Type	Journal Article
Author	Yuval Itescu
Author	Rachel Schwarz
Author	Colin M. Donihue
Author	Alex Slavenko
Author	Stephanos A. Roussos
Author	Kostas Sagonas
Author	Efstratios D. Valakos
Author	Johannes Foufopoulos
Author	Panayiotis Pafilis
Author	Shai Meiri
Abstract	Aim: Animal body sizes are often remarkably variable across islands, but despite much research we still have a poor understanding of both the patterns and the drivers of body size evolution. Theory predicts that interspecific competition and predation pressures are relaxed on small, remote islands, and that these conditions promote body size evolution. We studied body size variation across multiple insular populations of 16 reptile species co-occurring in the same archipelago and tested which island characteristics primarily drive body size evolution, the nature of the common patterns, and whether co-occurring species respond in a similar manner to insular conditions. Location: Aegean Sea islands. Time period: 1984-2016. Major taxa studied: Reptiles. Methods: We combined fieldwork, museum measurements and a comprehensive literature survey to collect data on nearly 10,000 individuals, representing eight lizard and eight snake species across 273 islands. We also quantified a large array of predictors to assess directly the effects of island area, isolation (both spatial and temporal), predation and interspecific competition on body size evolution. We used linear models and meta-analyses to determine which predictors are informative for all reptiles, for lizards and snakes separately, and for each species. Results: Body size varies with different predictors across the species we studied, and patterns differ within families and between lizards and snakes. Each predictor influenced body size in at least one species, but no general trend was recovered. As a group, lizards are hardly affected by any of the predictors we tested, whereas snake size generally increases with area and with competitor and predator richness, and decreases with isolation. Main conclusions: No factor emerges as a predominant driver of Aegean reptile sizes. This contradicts theories of general body size evolutionary trajectories on islands. We conclude that overarching generalizations oversimplify patterns and processes of reptile body size evolution on islands. Instead, species' autecology and island particularities interact to drive the course of size evolution.
Date	MAY 2018
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
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Publication Global Ecology and Biogeography
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Tags:

area, body size, competition, island area, isolation, life, lizard, lizards, mainland, natural-selection, populations, predation, rule, sexual size, snakes

Attachments

- Full Text

Increased energy differentially increases richness and abundance of optimal body sizes in deep-sea wood falls

Type Journal Article
Author Craig R. McClain
Author James P. Barry
Author Thomas J. Webb
Abstract Theoretical and empirical studies suggest that the total energy available in natural communities influences body size as well as patterns of abundance and diversity. But the precise mechanisms underlying these relationships or how these three ecological properties relate remain elusive. We identify five hypotheses relating energy availability, body size distributions, abundance, and species richness within communities, and we use experimental deep-sea wood fall communities to test their predicted effects both on descriptors describing the species-richness-body-size distribution, and on trends in species richness within size classes over an energy gradient (size-class-richness relationships). Invertebrate communities were taxonomically identified, weighed, and counted from 32 Acacia sp. logs ranging in size from 0.6 to 20.6 kg (corresponding to different levels of energy available), which were deployed at 3,203 m in the Northeast Pacific Ocean for 5 and 7 yr. Trends in both the species-richness-body-size distribution and the size-class-richness distribution with increasing wood fall size provide support for the Increased Packing hypothesis: species richness increases with increasing wood fall size but only in the modal size class. Furthermore, species richness of body size classes reflected the abundance of individuals in that size class. Thus, increases in richness in the modal size class with increasing energy were concordant with increases in abundance within that size class. The results suggest that increases in species richness occurring as energy availability increases may be isolated to specific niches, e.g., the body size classes, especially in communities developing on discrete and energetically isolated resources such as deep sea wood falls.
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Tags:

area, body size, boring bivalves, community assembly, community structure, competition, distributions, diversity, energy, marine, niche packing, patterns, population-density, productivity, santa-rosalia, species-diversity, species-energy relationship

Attachments

- Accepted Version

Increasing climate-driven taxonomic homogenization but functional differentiation among river macroinvertebrate assemblages

Type Journal Article
Author Theophile L. Mouton
Author Jonathan D. Tonkin
Author Fabrice Stephenson
Author Piet Verburg
Author Mathieu Floury
Abstract Global change is increasing biotic homogenization globally, which modifies the functioning of ecosystems. While tendencies towards taxonomic homogenization in biological communities have been extensively studied, functional homogenization remains an understudied facet of biodiversity. Here, we tested four hypotheses related to long-term changes (1991-2016) in the taxonomic and functional arrangement of freshwater macroinvertebrate assemblages across space and possible drivers of these changes. Using data collected annually at 64 river sites in mainland New Zealand, we related temporal changes in taxonomic and functional spatial beta-diversity, and the contribution of individual sites to beta-diversity, to a set of global, regional, catchment and reach-scale environmental descriptors. We observed long-term, mostly climate-induced, temporal trends towards taxonomic homogenization but functional differentiation among macroinvertebrate assemblages. These changes were mainly driven by replacements of species and functional traits among assemblages, rather than nested species loss. In addition, there was no difference between the mean rate of change in the taxonomic and functional facets of beta-diversity. Climatic processes governed overall population and community changes in these freshwater ecosystems, but were amplified by multiple anthropogenic,

topographic and biotic drivers of environmental change, acting widely across the landscape. The functional diversification of communities could potentially provide communities with greater stability, resistance and resilience capacity to environmental change, despite ongoing taxonomic homogenization. Therefore, our study highlights a need to further understand temporal trajectories in both taxonomic and functional components of species communities, which could enable a clearer picture of how biodiversity and ecosystems will respond to future global changes.

Date DEC 2020
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:41
Extra Place: Hoboken Publisher: Wiley WOS:000582400400001
Volume 26
Pages 6904-6915
Publication Global Change Biology
DOI 10.1111/gcb.15389
Issue 12
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:52:53
Modified 15/03/2023, 14:52:53

Tags:

&#8208, &#946, beta diversity, biodiversity loss, biotic homogenization, climate change, diversity, flow regimes, freshwater macroinvertebrates, functional diversity, human disturbance, invertebrate communities, land-use, new-zealand, site dissimilarity, stream, water-quality network

Attachments

- Full Text

Increasing climatic decoupling of bird abundances and distributions

Type Journal Article
Author Duarte S. Viana
Author Jonathan M. Chase
Abstract Using a 30-year dataset of North American bird species, the authors show that species' abundances and distributions have become more decoupled from climate over time and that this is associated with ecological traits; the effect is particularly strong in threatened species. Species abundances and distributions are changing in response to changing climate and other anthropogenic drivers but how this translates into how well species can match their optimal climate conditions as they change is not well understood. Using a continental-scale 30-year time series, we quantified temporal trends in climate matching of North American bird species and tested whether geographical variation in rates of climate and land use change and/or species traits could underlie variation in trends among species. Overall, we found that species abundances and distributions are becoming more decoupled from

climate as it changes through time. Species differences in climate matching trends were related to their ecological traits, particularly habitat specialization, but not to average rates of climate and land use change within the species' ranges. Climatic decoupling through time was particularly prominent for birds that were declining in abundance and occupancy, including threatened species. While we could not discern whether climate decoupling causes or is caused by the negative population trends, higher climatic decoupling in declining species could lead to a feedback as birds experience increasing exposure to suboptimal climatic conditions.

Date SEP 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:57
Extra Place: Berlin Publisher: Nature Portfolio WOS:000825194100001
Volume 6
Pages 1299-+
Publication Nature Ecology & Evolution
DOI 10.1038/s41559-022-01814-y
Issue 9
Journal Abbr Nat. Ecol. Evol.
ISSN 2397-334X
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

ability, avian thermoregulation, capacity, global diversity, impacts, land-use change, patterns, richness, track, traits

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Increasing hydrologic variability threatens depleted anadromous fish populations

Type Journal Article

Author Eric J. Ward
Author Joseph H. Anderson
Author Tim J. Beechie
Author George R. Pess
Author Michael J. Ford

Abstract Predicting effects of climate change on species and ecosystems depend on understanding responses to shifts in means (such as trends in global temperatures), but also shifts in climate variability. To evaluate potential responses of anadromous fish populations to an increasingly variable environment, we performed a hierarchical analysis of 21 Chinook salmon populations from the Pacific Northwest, examining support for changes in river flows and flow variability on population growth. More than half of the rivers analyzed have already experienced significant increases in flow variability over the last 60years, and this study shows that this increase in variability in freshwater flows has a more negative effect than any other climate signal included in our model. Climate change models predict that this region will experience warmer winters and more variable flows, which may limit the ability of these populations to recover.

Date JUL 2015
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:30
Extra Place: Hoboken Publisher: Wiley WOS:000356422500005
Volume 21
Pages 2500-2509
Publication Global Change Biology
DOI 10.1111/gcb.12847
Issue 7
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

anadromous fish, chinook salmon, climate change, climate-change, depths, ecosystem, endangered species, environmental variability, evolutionary, hydrologic variability, impacts, responses, risk, salmon, stream, survival, winter storms

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Increasing temperature and productivity change biomass, trophic pyramids and community-level omega-3 fatty acid content in subarctic lake food webs

Type Journal Article

Author Ossi Keva
Author Sami J. Taipale
Author Brian Hayden
Author Stephen M. Thomas
Author Jussi Vesterinen
Author Paula Kankaala
Author Kimmo K. Kahilainen

Abstract Climate change in the Arctic is outpacing the global average and land-use is intensifying due to exploitation of previously inaccessible or unprofitable natural resources. A comprehensive understanding of how the joint effects of changing climate and productivity modify lake food web structure, biomass, trophic pyramid shape and abundance of physiologically essential biomolecules (omega-3 fatty acids) in the biotic community is lacking. We conducted a space-for-time study in 20 subarctic lakes spanning a climatic (+3.2 degrees C and precipitation: +30%) and chemical (dissolved organic carbon: +10 mg/L, total phosphorus: +45 mu g/L and total nitrogen: +1,000 mu g/L) gradient to test how temperature and productivity jointly affect the structure, biomass and community fatty acid content (eicosapentaenoic acid [EPA] and docosahexaenoic acid [DHA]) of whole food webs. Increasing temperature and productivity shifted lake communities towards dominance of warmer, murky-water-adapted taxa, with a general increase in the biomass of primary producers, and secondary and tertiary consumers, while primary invertebrate consumers did not show equally clear trends. This process altered various trophic pyramid structures towards an hour glass shape in the warmest and most productive lakes. Increasing temperature and productivity had negative fatty acid content trends (mg EPA + DHA/g dry weight) in primary producers and primary consumers, but not in secondary nor tertiary fish consumers. The massive biomass increment of fish led to increasing areal fatty acid content (kg EPA + DHA/ha) towards increasingly warmer, more productive lakes, but there were no significant trends in other trophic levels. Increasing temperature and productivity are shifting subarctic lake communities towards systems characterized by increasing dominance of cyanobacteria and cyprinid fish, although decreasing quality in terms of EPA + DHA content was observed only in phytoplankton, zooplankton and profundal benthos.

Date	JAN 2021
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed	15/03/2023, 14:47:25
Extra	Place: Hoboken Publisher: Wiley WOS:000585071900001
Volume	27
Pages	282-296
Publication	Global Change Biology
DOI	10.1111/gcb.15387
Issue	2
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:47:34
Modified	15/03/2023, 14:47:34

Tags:

3 hufa, bioaccumulation, chain length, climate, coregonus, doc, ecosystem size, eutrophication, fish, food web structure, forestry, land&#8208, morphometry, nutrients, omega&#8208, polyunsaturated fatty-acids, populations, trophic level, trophic pyramid, use

Attachments

- Accepted Version

Insects and recent climate change

Type	Journal Article
Author	Christopher A. Halsch
Author	Arthur M. Shapiro
Author	James A. Fordyce
Author	Chris C. Nice
Author	James H. Thorne
Author	David P. Waetjen
Author	Matthew L. Forister

Abstract Insects have diversified through more than 450 million y of Earth's changeable climate, yet rapidly shifting patterns of temperature and precipitation now pose novel challenges as they combine with decades of other anthropogenic stressors including the conversion and degradation of land. Here, we consider how insects are responding to recent climate change while summarizing the literature on long-term monitoring of insect populations in the context of climatic fluctuations. Results to date suggest that climate change impacts on insects have the potential to be considerable, even when compared with changes in land use. The importance of climate is illustrated with a case study from the butterflies of Northern California, where we find that population declines have been severe in high-elevation areas removed from the most immediate effects of habitat loss. These results shed light on the complexity of montane-adapted insects responding to changing abiotic conditions. We also consider methodological issues that would improve syntheses of results across long-term insect datasets and highlight directions for future empirical work.

Date JAN 12 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:09
Extra Place: Washington Publisher: Natl Acad Sciences WOS:000607277100004
Volume 118
Pages e2002543117
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.2002543117
Issue 2
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
Date Added 15/03/2023, 14:27:14
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Tags:

abundance, Anthropocene, butterflies, climate change, communities, declines, drivers, extinction, extinction risk, extreme weather, perspective, population decline, responses, shifts, trends

Attachments

- Full Text

Interannual variation and long-term trends in proportions of resident individuals in partially migratory birds

Type Journal Article

Author Kalle Meller
Author Anssi V. Vahatalo
Author Tatu Hokkanen
Author Jukka Rintala

Author Markus Piha
Author Aleksi Lehikoinen

Abstract Partial migration - a part of a population migrates and another part stays resident year-round on the breeding site - is probably the most common type of migration in the animal kingdom, yet it has only lately garnered more attention. Theoretical studies indicate that in partially migratory populations, the proportion of resident individuals (PoR) should increase in high latitudes in response to the warming climate, but empirical evidence exists for few species. We provide the first comprehensive overview of the environmental factors affecting PoR and the long-term trends in PoR by studying 27 common partially migratory bird species in Finland. The annual PoR values were calculated by dividing the winter bird abundance by the preceding breeding abundance. First, we analysed whether early-winter temperature, winter temperature year before or the abundance of tree seeds just before overwintering explains the interannual variation in PoR. Secondly, we analysed the trends in PoR between 1987 and 2011. Early-winter temperature explained the interannual variation in PoR in the waterbirds (waterfowl and gulls), most likely because the temperature affects the ice conditions and thereby the feeding opportunities for the waterbirds. In terrestrial species, the abundance of seeds was the best explanatory variable. Previous winter's temperature did not explain PoR in any species, and thus, we conclude that the variation in food availability caused the interannual variation in PoR. During the study period, PoR increased in waterbirds, but did not change in terrestrial birds. Partially migratory species living in physically contrasting habitats can differ in their annual and long-term population-level behavioural responses to warming climate, possibly because warm winter temperatures reduce ice cover and improve the feeding possibilities of waterbirds but do not directly regulate the food availability for terrestrial birds.

Date MAR 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:48
Extra Place: Hoboken Publisher: Wiley WOS:000370959300026
Volume 85
Pages 570-580
Publication Journal of Animal Ecology
DOI 10.1111/1365-2656.12486
Issue 2
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

animal movement, autumn migration, behavior, bird feeding, climate change, climate-change, density-dependent strategy, european birds, finland, fluctuating food availability, non-breeding habitat quality, population, range shift, reproduction, wintering area

Attachments

- Submitted Version

Interdecadal changes in at-sea distribution and abundance of subantarctic seabirds along a latitudinal gradient in the Southern Indian Ocean

Type Journal Article

Author Clara Peron
Author Matthieu Authier
Author Christophe Barbraud
Author Karine Delord
Author Dominique Besson
Author Henri Weimerskirch

Abstract Long-term demographic studies have recently shown that global climate change together with increasing direct impacts of human activities, such as fisheries, are affecting the population dynamics of marine top predators. However, the effects of these factors on species distribution and abundance at sea are still poorly understood, particularly in marine ecosystems of the southern hemisphere. Using a unique long-term data set of at-sea observations, we tested for interdecadal (1980s vs. 2000s) changes in summer abundance and distribution of 12 species of Albatrosses and Petrels along a 30 degrees latitudinal gradient between tropical and Antarctic waters of the southern Indian Ocean. There were contrasting effects of climate change on subantarctic seabird distribution and abundance at sea. While subtropical waters showed the highest rate of warming, the species that visited this water mass showed the greatest changes in distribution and abundance. The abundance of Wandering Albatrosses (Diomedea exulans), White-chinned Petrels (Procellaria aequinoctialis) and Giant Petrels (Macronectes sp.) declined markedly, whereas the other species showed contrasting trends or did not change. With the exception of the White-chinned Petrel, these decreases were at least partly related to regional increase in sea surface temperature. The southward shift of Wandering Albatross and Prions (Pachyptila spp.) distributions could be ascribed to species redistribution or decrease in abundance due to warming of the subtropical waters. Surprisingly, White-chinned Petrel distribution shifted northward, suggesting more complex mechanisms. This study is the first to document a shift in species range in the Southern Ocean related to climate change and contrasting abundance changes. It suggests that some species might experience more severe impacts from climate change depending on the water masses they visit. As climate changes are predicted to continue in the next decades, understanding species responses to climate change is crucial for conservation management, especially when their conservation status is critical or unknown.

Date JUL 2010
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:28
Extra Place: Hoboken Publisher: Wiley WOS:000278308100001
Volume 16
Pages 1895-1909
Publication Global Change Biology
DOI 10.1111/j.1365-2486.2010.02169.x
Issue 7
Journal Abbr Glob. Change Biol.
ISSN 1354-1013

Date Added 15/03/2023, 14:52:53
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Tags:

albatrosses, at-sea survey, Bayesian, bird island, california current, climate change, climate-change, community, evolutionary responses, longline fishery, mixture model, petrels procellaria-aequinoctialis, population-dynamics, populations trends, prey consumption, Procellariiform, zero inflation

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Intraguild predation leads to cascading effects on habitat choice, behaviour and reproductive performance

Type Journal Article
Author Anna-Katharina Mueller
Author Nayden Chakarov
Author Hanna Heseker
Author Oliver Krueger
Abstract Intraguild predation (IGP) is a commonly recognized mechanism influencing the community structure of predators, but the complex interactions are notoriously difficult to disentangle. The mesopredator suppression hypothesis predicts that a superpredator may either simultaneously repress two mesopredators, restrain the dominant one and thereby release the subdominant mesopredator, or elicit different responses by both mesopredators. We show the outcome arising from such conditions in a three-level predator assemblage (Eurasian eagle owl Bubo bubo L., northern goshawk Accipiter gentilis L. and common buzzard Buteo buteo L.) studied over 25years. In the second half of the study period, the eagle owl re-colonized the study area, thereby providing a natural experiment of superpredator introduction. We combined this set-up with detailed GIS analysis of habitat use and a field experiment simulating intrusion by the superpredator into territories of the subdominant mesopredator, the buzzard. Although population trends were positive for all three species in the assemblage, the proportion of failed breeding attempts increased significantly in both mesopredators after the superpredator re-colonized the area. We predicted that superpredator-induced niche shifts in the dominant mesopredator may facilitate mesopredator coexistence in superpredator-free refugia. We found significant changes in nesting habitat choice in goshawk, but not in buzzard. Since competition for enemy-free refugia and the rapid increase in population density may have constrained niche shifts of the subdominant mesopredator, we further predicted behavioural changes in response to the superpredator. The field experiment indeed showed a significant increase in aggressive response of buzzards towards eagle owl territory intrusion over the course of 10years, probably due to phenotypic plasticity in the response towards superpredation risk. Overall, our results show that intraguild predation can be a powerful force of behavioural change, simultaneously influencing habitat use and aggressiveness in predator communities. These changes might help to buffer mesopredator populations against the negative effects of intraguild predation.
Date MAY 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:36

Extra Place: Hoboken Publisher: Wiley WOS:000375121400018
Volume 85
Pages 774-784
Publication Journal of Animal Ecology
DOI 10.1111/1365-2656.12493
Issue 3
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
Date Added 15/03/2023, 14:29:40
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Tags:

aggression, birds of prey, breeding performance, buzzard buteo-buteo, common buzzard, eagle owls, goshawk accipiter-gentilis, individual variation, long-term, non-lethal effects, population, raptor, raptors, territory choice, top predators, top predator

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Isotopic niche partitioning between two apex predators over time

Type Journal Article

Author Massimiliano Drago
Author Luis Cardona
Author Valentina Franco-Trecu
Author Enrique A. Crespo
Author Damian G. Vales
Author Florencia Borella
Author Lisette Zenteno
Author Enrique M. Gonzales
Author Pablo Inchausti

Abstract 1. Stable isotope analyses have become an important tool in reconstructing diets, analysing resource use patterns, elucidating trophic relations among predators and understanding the structure of food webs. 2. Here, we use stable carbon and nitrogen isotope ratios in bone collagen to reconstruct and compare the isotopic niches of adult South American fur seals (Arctocephalus australis; n = 86) and sea lions (Otaria flavescens; n = 49) - two otariid species with marked morphological differences - in the Rio de la Plata estuary (Argentina - Uruguay) and the adjacent Atlantic Ocean during the second half of the 20th century and the beginning of the 21st century. Samples from the middle Holocene (n = 7 fur seals and n = 5 sea lions) are also included in order to provide a reference point for characterizing resource partitioning before major anthropogenic modifications of the environment. 3. We found that the South American fur seals and South American sea lions had distinct isotopic niches during the middle Holocene. Isotopic niche segregation was similar at the beginning of the second half of the 20th century, but has diminished over time. 4. The progressive convergence of the isotopic niches of these two otariids during the second half of the 20th century and the beginning of the 21st century is most likely due to the increased reliance of South American fur seals on demersal prey. 5. This recent dietary change in South American fur seals can be explained by at least two non-mutually exclusive mechanisms: (i) the decrease in the abundance of sympatric South American sea lions as a consequence of small colony size and high pup mortality resulting from commercial sealing; and (ii) the decrease in the average size of demersal fishes due to intense fishing of the larger class sizes, which may have increased their accessibility to those eared seals with a smaller mouth gape, that is, South American fur seals of both sexes and female South American sea lions.

Date	JUL 2017
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:24
Extra	Place: Hoboken Publisher: Wiley WOS:000403146400007
Volume	86
Pages	766-780
Publication	Journal of Animal Ecology
DOI	10.1111/1365-2656.12666
Issue	4
Journal Abbr	J. Anim. Ecol.
ISSN	0021-8790
Date Added	15/03/2023, 14:29:40
Modified	15/03/2023, 14:29:40

Tags:

american sea lion, arctocephalus-australis, coastal evolution, de-la-plata, fur seals, marine mammals, marine predators, otaria-flavescens, pinnipeds, population trends, southern brazil, stable isotopes, standard ellipse area, trophic ecology, weakfish cynoscion-guatucupa

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Juvenile salmonid populations in a temperate river system track synoptic trends in climate

Type	Journal Article
Author	Esther Clews
Author	Isabelle Durance
Author	I. P. Vaughan
Author	S. J. Ormerod

Abstract Widespread declines among Atlantic salmon (Salmo salar) and brown trout (Salmo trutta) over recent decades have been linked to pollution, exploitation and catchment modification, but climate change is increasingly implicated. We used long-term, geographically extensive data from the Welsh River Wye, formerly a major salmon river, to examine whether climatically mediated effects on juveniles (> 0+) might contribute to population change. Populations of Atlantic salmon and brown trout fell across the Wye catchment, respectively, by 50% and 67% between 1985 and 2004, but could not be explained by pollution because water quality improved during this time. Stream temperatures, estimated from calibrations against weekly air temperature at eight sites, increased by 0.5-0.7 degrees C in summer and 0.7-1.0 degrees C in winter, with larger tributaries warming more than shaded headwaters. Rates of winter warming were slightly greater after accounting for the effect of the North Atlantic Oscillation (1.1-1.4 degrees C). However, warming through time was smaller than measured variations among tributaries, and alone was insufficient to explain variations in salmonid density. Instead, population variations were best explained in multilevel mixed models by a synoptic variate representing a trend towards hotter, drier summers, implying interactions between climate warming, varying discharge and fluctuations in both brown trout and salmon. Taken alongside recent data showing effects of warming on survival at sea, these data suggest that Atlantic salmon might be jeopardized by future climatic effects in both their marine and freshwater stages. Effects on nondiadromous brown trout also imply climatically mediated processes in freshwaters or their catchments. Climate projections for the United Kingdom suggest that altered summer flow and increasing summer temperatures could exacerbate losses further in these species, and we advocate management actions that combine reduced abstraction with enhanced riparian shading.

Date	DEC 2010
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:23
Extra	Place: Hoboken Publisher: Wiley WOS:000283726600010
Volume	16
Pages	3271-3283
Publication	Global Change Biology
DOI	10.1111/j.1365-2486.2010.02211.x
Issue	12
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:52:53
Modified	15/03/2023, 14:52:53

Tags:

atlantic salmon, body-size, brown trout, climate, density, discharge, fish, fresh-water, growth, long-term changes, long-term study, river, salar, salmon, stream, temperature, trout, water temperature

Attachments

- Submitted Version

Land-use and climate change effects on population size and extinction risk of Andean plants

Type	Journal Article
Author	Kenneth J. Feeley
Author	Miles R. Silman

Abstract Andean plant species are predicted to shift their distributions, or 'migrate,' upslope in response to future warming. The impacts of these shifts on species' population sizes and their abilities to persist in the face of climate change will depend on many factors including the distribution of individuals within species' ranges, the ability of species to migrate and remain at equilibrium with climate, and patterns of human land-use. Human land-use may be especially important in the Andes where anthropogenic activities above tree line may create a hard barrier to upward migrations, imperiling high-elevation Andean biodiversity. In order to better understand how climate change may impact the Andean biodiversity hotspot, we predict the distributional responses of hundreds of plant species to changes in temperature incorporating population density distributions, migration rates, and patterns of human land-use. We show that plant species from high Andean forests may increase their population sizes if able to migrate onto the expansive land areas above current tree line. However, if the pace of climate change exceeds species' abilities to migrate, all species will experience large population losses and consequently may face high risk of extinction. Using intermediate migration rates consistent with those observed for the region, most species are still predicted to experience population declines. Under a business-as-usual land-use scenario, we find that all species will experience large population losses regardless of migration rate. The effect of human land-use is most pronounced for high-elevation species that switch from predicted increases in population sizes to predicted decreases. The overriding influence of land-use on the predicted responses of Andean species to climate change can be viewed as encouraging since there is still time to initiate conservation programs that limit disturbances and/or facilitate the upward migration and persistence of Andean plant species.

Date DEC 2010
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
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Extra Place: Hoboken Publisher: Wiley WOS:000283726600005
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Pages 3215-3222
Publication Global Change Biology
DOI 10.1111/j.1365-2486.2010.02197.x
Issue 12
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Modified 15/03/2023, 14:51:19

Tags:

abundance, area, bias, bioclimatic niche, climate change, conservation, conservation biogeography, distribution, land-use, range size, redd, shifts, species distributions, tree line, trends

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Land-use change reduces habitat suitability for supporting managed honey bee colonies in the Northern Great Plains

Type Journal Article

Author Clint R. V. Otto
Author Cali L. Roth
Author Benjamin L. Carlson
Author Matthew D. Smart

Abstract Human reliance on insect pollination services continues to increase even as pollinator populations exhibit global declines. Increased commodity crop prices and federal subsidies for biofuel crops, such as corn and soybeans, have contributed to rapid land-use change in the US Northern Great Plains (NGP), changes that may jeopardize habitat for honey bees in a part of the country that supports >40% of the US colony stock. We investigated changes in biofuel crop production and grassland land covers surrounding similar to 18,000 registered commercial apiaries in North and South Dakota from 2006 to 2014. We then developed habitat selection models to identify remotely sensed land-cover and land-use features that influence apiary site selection by Dakota beekeepers. Our study demonstrates a continual increase in biofuel crops, totaling 1.2 Mha, around registered apiary locations in North and South Dakota. Such crops were avoided by commercial beekeepers when selecting apiary sites in this region. Furthermore, our analysis reveals how grasslands that beekeepers target when selecting commercial apiary locations are becoming less common in eastern North and South Dakota, changes that may have lasting impact on pollinator conservation efforts. Our study highlights how land-use change in the NGP is altering the landscape in ways that are seemingly less conducive to beekeeping. Our models can be used to guide future conservation efforts highlighted in the US national pollinator health strategy by identifying areas that support high densities of commercial apiaries and that have exhibited significant land-use changes.

Date SEP 13 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
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Extra Place: Washington Publisher: Natl Acad Sciences WOS:000383092000059
Volume 113
Pages 10430-10435
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.1603481113
Issue 37
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
Date Added 15/03/2023, 14:29:40
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Tags:

apiary selection models, Apis mellifera, conservation reserve program, conversion, croplands, ecosystem services, grasslands, land use, land-cover trends, plants, pollinators, preference, survival, trends

Attachments

- Full Text

Landscape effects on birds in urban woodlands: an analysis of 34 Swedish cities

Type Journal Article
Author Marcus Hedblom
Author Bo Soderstrom

Abstract Aim To compare bird abundances in woodlands along gradients from the city centre to the peri-urban area. To evaluate the importance of the proportion of woodland within the city and in the peri-urban landscape to forest bird communities breeding in urban woodlands. To test whether fragmentation effects on birds were linked to the type of peri-urban matrix. Location A total of 34 Swedish cities with > 10,000 inhabitants in south-central Sweden. The study area covered 105,000 km2, in which 84% of the Swedish population of 9.1 million lives. Methods Repeated point count surveys were conducted in 2004 in a total of 474 woodlands. General linear models were used to test for possible differences in abundance along urban to peri-urban gradients, and to regress bird abundances in local urban woodlands on: (1) total woodland cover in the city, (2) total woodland cover in the peri-urban landscape, (3) the interaction between woodland cover in the city and in the peri-urban area, (4) region, and (5) human density. Results More than 12,000 individuals of 100 forest bird species were recorded. Of the 34 most common species detected, 13 bird species had higher abundances in urban than in peri-urban woodlands, and seven species showed the opposite trend. The bird community of urban woodlands was characterized by species associated with deciduous forests and tree nesters, whereas the bird community of peri-urban woodlands was characterized by species associated with coniferous woodland and ground nesters. Twelve species were significantly linearly associated with the proportion of urban woodland and/or the proportion of peri-urban woodland, and a further eight species were associated with the interaction between these two factors. Local breeding bird abundances of four species were significantly positively associated with the proportion of urban woodland only in farmland-dominated landscapes. Main conclusions Fragmentation effects on some urban birds are linked to the type of peri-urban matrix. In farmland landscapes, peri-urban woodlands may have been too scarce to act as a source of bird immigrants to fragmented urban woodlands. To maintain populations of specialized forest birds within cities in landscapes dominated by agriculture, it is of paramount importance to conserve any remaining urban woodlands.

Date JUL 2010

Language English

Short Title Landscape effects on birds in urban woodlands

Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1

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Issue 7

Journal Abbr J. Biogeogr.

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Tags:

abundance, avifauna, Birds, city forest, conservation, diversity, forest remnant, forests, fragmentation, gradient, habitat fragmentation, land-use, landscape, matrix, populations, seminatural pastures, Sweden, threshold, urban gradient

Large mammalian herbivores modulate plant growth form diversity in a tropical rainforest

Type Journal Article

Author Yuri Souza
Author Nacho Villar
Author Valesca Zipparro
Author Sergio Nazareth
Author Mauro Galetti

Abstract The world's terrestrial biomes are broadly classified according to the dominant plant growth forms that define ecosystem structure and processes. Although the abundance and distribution of different plant growth forms can be strongly determined by factors such as climate and soil composition, large mammalian herbivores have a strong impact on plant communities, thus defaunation (the local or functional extinction of large animals) has the potential to alter the compositional structure of plant growth forms in natural ecosystems. Tropical rainforests sustain a high diversity of growth forms, including trees, palms, lianas, shrubs, herbs and bamboos, all of which play important ecosystem functions. Here, we experimentally evaluate how large mammalian herbivores affect the dominance, diversity and coexistence of these major tropical forest plant growth forms, by monitoring communities of saplings on the understorey in 43 paired exclusion plots in a long-term replicated exclusion experiment in the understorey of the Atlantic forest of Brazil. Over the course of 10 years large herbivore exclusion decreased diversity among growth forms, increased the absolute abundance of palms and trees (22% and 38% respectively) and increased the diversity of species within these two groups, to the detriment of other growth forms. Furthermore, all pairwise relationships between growth forms were positive on plots where herbivores had access, whereas several strong negative relationships emerged in plots where herbivores were excluded. This occurred despite strong background directional temporal trends affecting plant communities in both experimental treatments across the region. Synthesis. Our work indicates that the defaunation alters growth form dominance by favouring palms and trees while eroding diversity among growth forms and coexistence on a temporal scale. Large herbivore mammals promote diversity among growth forms, preventing the hyper-dominance of trees and palms, yet without supressing the diversity of species within growth forms. We argue that large herbivore mammals affect growth forms through several non-mutually exclusive mechanisms, including herbivory, seed dispersal and physical disturbance, as well as differential effects linked to the morphological and physiological adaptations of growth forms. We conclude that defaunation might lead to profound impacts on important ecosystem functions underpinned by growth form diversity, and result in vertical and horizontal structural simplification of tropical rainforests.

Date APR 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
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Extra Place: Hoboken Publisher: Wiley WOS:000762594000001
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Publication Journal of Ecology
DOI 10.1111/1365-2745.13846

Issue 4
Journal Abbr J. Ecol.
ISSN 0022-0477
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Tags:

atlantic forest, biodiversity, competitive dynamics, defaunation, dispersal, diversity, ecosystem function, global patterns, lianas, long-term exclosure, population and community dynamics, seedling growth, survival, tree, trophic interactions

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Large-scale responses of herbivore prey to canid predators and primary productivity

Type Journal Article
Author Mike Letnic
Author William J. Ripple
Abstract Aim: The primacy of top-down (consumption) and bottom-up effects (primary productivity) as forces structuring ecological communities is a controversial topic. The exploitation ecosystems hypothesis (EEH) was invoked to explain biogeographical trends in plant and consumer biomass, and differs from the top-down/bottom-up dichotomy by predicting that the relative strength of these processes will vary along gradients of primary productivity. Here we test the prediction of the EEH that herbivore biomass should increase with increasing primary productivity where predators are rare, but show a negligible response to primary productivity where predators are common due to population regulation by predators. Location: Boreal and temperate regions of North America and Eurasia, and deserts of Australia. Time period: 1970-2016. Major taxa studied: Cervids and kangaroos. Methods: We obtained abundance indices of cervids at 42 locations from the literature and conducted spotlight surveys at 27 locations to derive estimates of kangaroo abundance. For analyses, herbivore abundances were converted to biomass per km(2). We tested our prediction using linear mixed effects models. Results: Herbivore biomass showed divergent responses to increasing primary productivity and the abundance of canid predators (grey wolves, Canis lupus/dingoes, Canis dingo). The slope of the relationship between herbivore biomass and net primary productivity did not differ between Australia and the northern boreal and temperate regions. Herbivore biomass increased in response to primary productivity where canid predators were rare, but showed muted responses to increasing productivity where canid predators were common. Main conclusions: Canid predators have strong suppressive effects on herbivore biomass that scale with primary productivity. Our study shows that the EEH has wide application to canid-predator-herbivore dynamics and may be relevant to the management of herbivores because it can provide an indication of how herbivore biomass and densities may vary in relation to ecosystem productivity and the presence and absence of canid predators.
Date AUG 2017
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
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Volume 26
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Publication Global Ecology and Biogeography
DOI 10.1111/geb.12593
Issue 8
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
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Tags:

apex predator, bottom up, deer, dynamics, exploitation ecosystems, gradients, hypothesis, kangaroo, large herbivore, north-america, patterns, primary productivity, systems, top down, top predators, trophic cascade

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Latitudinal gradients in the productivity of European migrant warblers have not shifted northwards during a period of climate change

Type Journal Article
Author Sarah M. Eglington
Author Romain Julliard
Author Gabriel Gargallo
Author Henk P. van der Jeugd
Author James W. Pearce-Higgins
Author Stephen R. Baillie
Author Robert A. Robinson
Abstract AimAs global temperatures have increased, many species distributions have exhibited polewards shifts, a trend that is predicted to continue in future decades. However, the mechanisms underlying such shifts are not well understood. Here we quantify the impact of large-scale variation in temperature on reproductive output within a group of migratory birds to assess the potential for future range changes. LocationWestern Europe. MethodsWe use data from captures of 350,000 individual birds, collected under constant effort ringing protocols from 1994-2006, to estimate productivity (percentage of juveniles caught) for seven species of migrant warblers (family Sylviidae) breeding in Europe in relation to spring temperature and latitude by fitting generalized linear mixed models. ResultsProductivity was highest at mid-latitudes for six of our seven study species and did not change significantly over the study period. Only one species (reed warbler, Acrocephalus scirpaceus) showed increased productivity at northern sites as expected. Six of the seven species also showed evidence for local adaptation, with productivity decreasing as temperatures diverged from the local mean. However, for three of these species the optimum' temperature was greater than the local mean temperature at the majority of sites. Main conclusionsThese results indicate that latitudinal gradients in productivity are likely to influence large-scale abundance patterns, but that adaptation to local climate conditions has the potential to constrain the rate of northward range shifts in many species.
Date APR 2015
Language English
Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
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Volume 24
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Publication Global Ecology and Biogeography
DOI 10.1111/geb.12267
Issue 4
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
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Tags:

abundance, Acrocephalus, birds, breeding parameters, butterflies, clutch size, constant effort ringing, constraints, demography, impacts, patterns, Phylloscopus, population declines, population dynamics, range distribution, Sylvia, Sylviidae, temperature, trends

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Liana species decline in Congo basin contrasts with global patterns

Type Journal Article

Author Frans Bongers
Author Corneille E. N. Ewango
Author Masha T. van der Sande
Author Lourens Poorter

Abstract Lianas, woody climbing plants, are increasing in many tropical forests, with cascading effects such as decreased forest productivity, carbon sequestration, and resilience. Possible causes are increasing forest fragmentation, CO2 fertilization, and drought. Determining the primary changing species and their underlying vital rates help explain the liana trends. We monitored over 17,000 liana stems for 13 yr in 20 ha of old-growth forest in the Congo Basin, and here we report changes and vital rates for the community and for the 87 most abundant species. The total liana abundance declined from 15,007 lianas in 1994 to 11,090 in 2001 to 9,978 in 2007. Over half (52%) of the evaluated species have significantly declining populations, showing that the community response is not the result of changes in a few dominant species only. Species density change (i.e., the change in number of individuals per hectare) decreased with mortality rate, tended to increase with recruitment rate, but was independent of growth rate. Species change was independent of functional characteristics important for plant responses to fragmentation, CO2, and drought, such as lifetime light requirements, climbing and dispersal mechanism, and leaf size. These results indicate that in Congo lianas do not show the reputed global liana increase, but rather a decline, and that elements of the reputed drivers underlying global liana change do not apply to this DR Congo forest. We suggest warfare in the Congo Basin to have decimated the elephant population, leading to less disturbance, forest closure, and declining liana numbers. Our results imply that, in this tropical forest, local causes (i.e., disturbance) override more global causes of liana change resulting in liana decline, which sharply contrasts with the liana increase observed elsewhere.

Date MAY 2020
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:13
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Volume 101
Publication Ecology
DOI 10.1002/ecy.3004
Issue 5
Journal Abbr Ecology
ISSN 0012-9658
Date Added 15/03/2023, 14:28:28
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Tags:

abundance, barro-colorado island, basal area, climbers, collapse, DR Congo, dynamics, el-nino, functional traits, Ituri, lianas, long-term changes, mortality, rain-forest, species abundance, tree growth, tropical forest, tropical forests

Attachments

- Full Text

Limited evidence for the demographic Allee effect from numerous species across taxa

Type Journal Article
Author Stephen D. Gregory
Author Corey J. A. Bradshaw
Author Barry W. Brook
Author Franck Courchamp
Abstract Extensive theoretical work on demographic Allee effects has led to the latent assumption that they are ubiquitous in natural populations, yet current empirical support for this phenomenon is sparse. We extended previous single-taxon analyses to evaluate the empirical support for demographic Allee effects in the per capita population growth rate of 1198 natural populations spanning all major taxa. For each population, we quantified the empirical support for five population growth models: no growth (random walk); exponential growth, with and without an Allee effect; and logistic growth, with and without an Allee effect. We used two metrics to quantify empirical support, information-theoretic and Bayesian strength of evidence, and observed top-rank frequency. The Ricker logistic model was both the most supported and most frequently top-ranked model, followed by random walk. Allee models had a combined relative support of 12.0% but were top-ranked in only 1.1% of the time series. Accounting for local climate variation and measurement error caused the loss of top-ranked Allee models, although the latter also increased their relative support. The 13 time series exhibiting Allee models were shorter and less

variable than other time series, although only three were non-trending. Time series containing observations at low abundance were not more likely and did not show higher support for Allee effect models. We conclude that there is relatively high potential for demographic Allee effects in these 1198 time series but comparatively few observed cases, perhaps due to the influences of climate and measurement error.

Date JUL 2010
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
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Issue 7
Journal Abbr Ecology
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Tags:

Akaike information criterion (AIC), Bayesian information criterion (BIC), conservation, demographic Allee effect, density-dependence, depensation, empirical support, events, evidence, exponential, extinction, fish stocks, invasion, population dynamics, population-dynamics, random walk, Ricker, time-series, variability

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Linking inter-annual variation in environment, phenology, and abundance for a montane butterfly community

Type Journal Article

Author James E. Stewart
Author Javier Gutierrez Illan
Author Shane A. Richards
Author David Gutierrez
Author Robert J. Wilson

Abstract Climate change has caused widespread shifts in species' phenology, but the consequences for population and community dynamics remain unclear because of uncertainty regarding the species-specific drivers of phenology and abundance, and the implications for synchrony among interacting species. Here, we develop a statistical model to quantify inter-annual variation in phenology and abundance over an environmental gradient, and use it to identify potential drivers of phenology and abundance in co-occurring species. We fit the model to counts of 10 butterfly species with single annual generations over a mountain elevation gradient, as an exemplar system in which temporally limited availability of biotic resources and favorable abiotic conditions impose narrow windows of seasonal activity. We estimate parameters describing changes in abundance, and the peak time and duration of the flight period, over ten years (2004-2013) and across twenty sample locations (930-2,050 m) in central Spain. We also use the model outputs to investigate relationships of phenology and abundance with temperature and rainfall. Annual shifts in phenology were remarkably consistent among species, typically showing earlier flight periods during years with warm conditions in March or May-June. In contrast, inter-annual variation in relative abundance was more variable among species, and generally less well associated with climatic conditions. Nevertheless, warmer temperatures in June were associated with increased relative population growth in three species, and five species had increased relative population growth in years with earlier flight periods. These results suggest that broadly coherent interspecific changes to phenology could help to maintain temporal synchrony in community dynamics under climate change, but that the relative composition of communities may vary due to interspecific inconsistency in population dynamic responses to climate change. However, it may still be possible to predict abundance change for species based on a robust understanding of relationships between their population dynamics and phenology, and the environmental drivers of both.

Date	JAN 2020
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:27:57
Extra	Place: Hoboken Publisher: Wiley WOS:000502379100001
Volume	101
Publication	Ecology
DOI	10.1002/ecy.2906
Issue	1
Journal Abbr	Ecology
ISSN	0012-9658
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Modified	15/03/2023, 14:28:28

Tags:

altitude, climate-change, developmental delay, dynamics, ectotherm, elevation gradient, emergence time, growing season, host plants, insects, Lepidoptera, microclimate, phenological synchrony, phenotypic traits, plasticity, responses, synchrony, trends

Attachments

- Full Text

Long-term change in a behavioural trait: truncated spawning distribution and demography in Northeast Arctic cod

Type	Journal Article
Author	Anders Frugard Opdal
Author	Christian Jorgensen

Abstract Harvesting may be a potent driver of demographic change and contemporary evolution, which both may have great impacts on animal populations. Research has focused on changes in phenotypic traits that are easily quantifiable and for which time series exist, such as size, age, sex, or gonad size, whereas potential changes in behavioural traits have been under-studied. Here, we analyse potential drivers of long-term changes in a behavioural trait for the Northeast Arctic stock of Atlantic cod Gadus morhua, namely choice of spawning location. For 104years (1866-1969), commercial catches were recorded annually and reported by county along the Norwegian coast. During this time period, spawning ground distribution has fluctuated with a trend towards more northerly spawning. Spawning location is analysed against a suite of explanatory factors including climate, fishing pressure, density dependence, and demography. We find that demography (age or age at maturation) had the highest explanatory power for variation in spawning location, while climate had a limited effect below statistical significance. As to potential mechanisms, some effects of climate may act through demography, and explanatory variables for demography may also have absorbed direct evolutionary change in migration distance for which proxies were unavailable. Despite these caveats, we argue that fishing mortality, either through demographic or evolutionary change, has served as an effective driver for changing spawning locations in cod, and that additional explanatory factors related to climate add no significant information.

Date APR 2015

Language English

Short Title Long-term change in a behavioural trait

Library Catalogue Web of Science Nextgen

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Issue 4

Journal Abbr Glob. Change Biol.

ISSN 1354-1013

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Tags:

age, behaviour, climate, climate-change, consequences, demography, evolution, fisheries, fishing, Gadus morhua, gadus-morhua l, growth, migration, Northeast Arctic cod, size, temperature, trait

Attachments

- Full Text

Long-term climate impacts on breeding bird phenology in Pennsylvania, USA

Type Journal Article

Author Molly E. McDermott

Author Lucas W. DeGroote

Abstract Climate change is influencing bird phenology worldwide, but we still lack information on how many species are responding over long temporal periods. We assessed how climate affected passerine reproductive timing and productivity at a constant effort mist-netting station in western Pennsylvania using a model comparison approach. Several lines of evidence point to the sensitivity of 21 breeding passerines to climate change over five decades. The trends for temperature and precipitation over 53 years were slightly positive due to intraseasonal variation, with the greatest temperature increases and precipitation declines in early spring. Regardless of broodedness, migration distance, or breeding season, 13 species hatched young earlier over time with most advancing > 3 days per decade. Warm springs were associated with earlier captures of juveniles for 14 species, ranging from 1- to 3-day advancement for every 1 degrees C increase. This timing was less likely to be influenced by spring precipitation; nevertheless, higher rainfall was usually associated with later appearance of juveniles and breeding condition in females. Temperature and precipitation were positively related to productivity for seven and eleven species, respectively, with negative relations evident for six and eight species. We found that birds fledged young earlier with increasing spring temperatures, potentially benefiting some multibrooded species. Indeed, some extended the duration of breeding in these warm years. Yet, a few species fledged fewer juveniles in warmer and wetter seasons, indicating that expected future increases could be detrimental to locally breeding populations. Although there were no clear relationships between life history traits and breeding phenology, species-specific responses to climate found in our study provide novel insights into phenological flexibility in songbirds. Our research underscores the value of long-term monitoring studies and the importance of continuing constant effort sampling in the face of climate change.

Date OCT 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
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Volume 22
Pages 3304-3319
Publication Global Change Biology
DOI 10.1111/gcb.13363
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Journal Abbr Glob. Change Biol.
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Tags:

arrival dates, autumn migration, breeding, climate change, distance, great tits, laying date, migration phenology, migratory birds, mist-netting, north-atlantic oscillation, phenology, population declines, precipitation, productivity, responses, spring temperatures, temperature

Long-term declines in bird populations in tropical agricultural countryside

Type Journal Article

Author Cagan H. Sekercioglu
Author Chase D. Mendenhall
Author Federico Oviedo-Brenes
Author Joshua J. Horns
Author Paul R. Ehrlich
Author Gretchen C. Daily

Abstract Tropical agriculture is a major driver of biodiversity loss, yet it can provide conservation opportunities, especially where protected areas are inadequate. To investigate the long-term biodiversity capacity of agricultural countryside, we quantified bird population trends in Costa Rica by mist netting 57,255 birds of 265 species between 1999 and 2010 in sun coffee plantations, riparian corridors, secondary forests, forest fragments, and primary forest reserves. More bird populations (69) were declining than were stable (39) or increasing (4). Declines were common in resident, insectivorous, and more specialized species. There was no relationship between the species richness of a habitat and its conservation value. High-value forest bird communities were characterized by their distinct species composition and habitat and dietary functional signatures. While 49% of bird species preferred forest to coffee, 39% preferred coffee to forest and 12% used both habitats, indicating that coffee plantations have some conservation value. Coffee plantations, although lacking most of the forest specialists, hosted 185 bird species, had the highest capture rates, and supported increasing numbers of some forest species. Coffee plantations with higher tree cover (7% vs. 13%) had more species with increasing capture rates, twice as many forest specialists, and half as many nonforest species. Costa Rican countryside habitats, especially those with greater tree cover, host many bird species and are critical for connecting bird populations in forest remnants. Diversified agricultural landscapes can enhance the biodiversity capacity of tropical countryside, but, for the long-term persistence of all forest bird species, large (> 1,000 ha) protected areas are essential.

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Language English
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URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
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Volume 116
Pages 9903-9912
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.1802732116
Issue 20
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
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Tags:

avian ecology, biodiversity, coffee, conservation, ecosystem services, estimators, forest fragmentation, global change, ornithology, rain, relative abundance, species richness, systems, tropical biology

Attachments

- Full Text

Long-term expansion of juniper populations in managed landscapes: patterns in space and time

Type	Journal Article
Author	Cristina Garcia
Author	Eva Moracho
Author	Ricardo Diaz-Delgado
Author	Pedro Jordano
Abstract	Forest cover has increased world-wide over the last decade despite continuous forest fragmentation. However, a lack of long-term demographic data hinders our understanding of the spatial dynamics of colonization in remnant populations inhabiting recently protected areas or set-aside rural lands. We investigated the population expansion of the Phoenician juniper (Juniperus phoenicea subsp. turbinata), which is an endozoochorous Mediterranean tree species inhabiting landscapes that have been managed for many centuries. By combining the photointerpretation of aerial photos that have been taken over the last 50years with in situ sampling and spatial analyses of replicated plots, we estimated the population growth over the chronosequence; identified hotspots, coldspots and outliers of regeneration; and assessed the roles of key environmental factors in driving demographic expansion patterns, including elevation, initial density and distance to remnant forests. Ecological factors leading to seed limitation, such as initial plant density, are expected to drive colonization patterns at the early stages. Factors mediating the competition for limiting resources, such as water availability, would prevail at later stages of expansion. We further expect that nucleated colonization patterns emerge driven by vertebrate seed dispersal. The photointerpretation of aerial images in combination with in situ measurements has yielded reliable density data. Overall, our results show a marked demographic expansion during the first decade followed by a period of steady and heterogeneous population growth with signs of local population decline. We found evidence of nucleated establishment patterns as expected for an endozoochorous species. Hotspots and outliers of regeneration emerged throughout the study chronosequence, whereas coldspots of regeneration only appeared at advanced colonization stages. Factors influencing dispersal limitation had contrasting effects at different colonization stages, and the initial density influenced population growth at various spatial scales.Synthesis. The photointerpretation of aerial images shows that the influence of dispersal limitation versus factors mediating competitive responses changes throughout colonization stages. Whereas dispersal limitation is the main factor influencing colonization at early stages, competition for local resources controls population growth at later stages. Therefore, long-term studies are required to capture the overall combined influence of key ecological factors in shaping long-term spatial demographic trends.
Date	NOV 2014
Language	English
Short Title	Long-term expansion of juniper populations in managed landscapes

Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
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Extra Place: Hoboken Publisher: Wiley WOS:000344333800021
Volume 102
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Publication Journal of Ecology
DOI 10.1111/1365-2745.12297
Issue 6
Journal Abbr J. Ecol.
ISSN 0022-0477
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Tags:

donana, ecological correlates, ecology, generalized additive mixed models, gradient, historical forest fragmentation, hotspots, Juniperus phoenicea subsp, long-term demographic trends, photointerpretation, plant population and community dynamics, recruitment, seed dispersal, spatial statistics, spatial-pattern, spatiotemporal dynamics, succession, turbinata, vegetation

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Long-term monitoring of an amphibian community after a climate change- and infectious disease-driven species extirpation

Type Journal Article
Author Jaime Bosch
Author Saioa Fernandez-Beaskoetxea
Author Trenton W. J. Garner
Author Luis Maria Carrascal
Abstract Infectious disease and climate change are considered major threats to biodiversity and act as drivers behind the global amphibian decline. This is, to a large extent, based on short-term studies that are designed to detect the immediate and strongest biodiversity responses to a threatening process. What few long-term studies are available, although typically focused on single species, report outcomes that often diverge significantly from the short-term species responses. Here, we report the results of an 18-year survey of an amphibian community exposed to both climate warming and the emergence of lethal chytridiomycosis. Our study shows that the impacts of infectious disease are ongoing but restricted to two out of nine species that form the community, despite the fact all species can become infected with the fungus. Climate warming appears to be affecting four out of the nine species, but the response of three of these is an increase in abundance. Our study supports a decreasing role of infectious disease on the community, and an increasing and currently positive effect of climate warming. We caution that if the warming trends continue, the net positive effect will turn negative as amphibian breeding habitat becomes unavailable as water bodies dry, a pattern that already may be underway.
Date JUN 2018
Language English

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URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
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Tags:

amphibian monitoring, batrachochytrium-dendrobatidis, bufo-bufo, chytridiomycosis, climate change, common midwife toad, global amphibian declines, population declines, time, transmission, trends, wildlife diseases

Attachments

- Full Text

Long-term monitoring reveals widespread and severe declines of understory birds in a protected Neotropical forest

Type Journal Article
Author Henry S. Pollock
Author Judith D. Toms
Author Corey E. Tarwater
Author Thomas J. Benson
Author James R. Karr
Author Jeffrey D. Brawn
Abstract Long-term studies on the population dynamics of tropical resident birds are few, and it remains poorly understood how their populations have fared in recent decades. Here, we analyzed a 44-y population study of a Neotropical understory bird assemblage from a protected forest reserve in central Panama to determine if and how populations have changed from 1977 to 2020. Using the number of birds captured in mist nets as an index of local abundance, we estimated trends over time for a diverse suite of 57 resident species that comprised a broad range of ecological and behavioral traits. Estimated abundances of 40 (similar to 70%) species declined over the sampling period, whereas only 2 increased. Furthermore, declines were severe: 35 of the 40 declining species exhibited large proportional losses in estimated abundance, amounting to >= 50% of their initial estimated abundances. Declines were largely independent of ecology (i.e., body mass, foraging guild, or initial abundance) or phylogenetic affiliation. These widespread, severe declines are particularly alarming, given that they occurred in a relatively large (similar to

22,000-ha) forested area in the absence of local fragmentation or recent land-use change. Our findings provide robust evidence of tropical bird declines in intact forests and bolster a large body of literature from temperate regions suggesting that bird populations may be declining at a global scale. Identifying the ecological mechanisms underlying these declines should be an urgent conservation priority.

Date	APR 19 2022
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:26:55
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000792746600005
Volume	119
Pages	e2108731119
Publication	Proceedings of the National Academy of Sciences of the United States of America
DOI	10.1073/pnas.2108731119
Issue	16
Journal Abbr	Proc. Natl. Acad. Sci. U. S. A.
ISSN	0027-8424
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Tags:

avian communities, biodiversity loss, climate-change, intact forest, long-term studies, north-america, panama, population declines, prey, rain, shifts, southern-oscillation, tropical bird, tropical birds

Attachments

- Full Text

Long-term responses of desert ant assemblages to climate

Type	Journal Article
Author	Heloise Gibb
Author	Blair F. Grossman
Author	Chris R. Dickman
Author	Orsolya Decker
Author	Glenda M. Wardle

Abstract Productivity is a key driver of ecosystem structure and function, so long-term studies are critical to understanding ecosystems with high temporal variation in productivity. In some deserts, productivity, driven by moisture availability, varies immensely over time (rainfall) and space (landscape factors). At high productivity, species richness is expected to be driven in opposing directions by abundance (More Individuals Hypothesis - MIH) and competition. While studies investigating the impacts of spatial variation in productivity on community structure are common, the impacts of temporal variability on productivity are poorly understood. We tested how well rainfall predicted the activity, species numbers and assemblage composition of ants and if responses were moderated by landscape position. We also asked whether the number of species (richness per sampling unit and estimated species richness) responded directly to rainfall or was moderated by ant activity or competition from dominant ants. Over a 22-year period, when annual rainfall fluctuated between 79 mm and 570 mm, we sampled ants using pitfall traps in paired dune and swale habitats in the Simpson Desert, Australia. We used climate records over this period to model changes in ant assemblages. Activity of dominant ants responded primarily to long-term rainfall, increasing exponentially, while subordinate ants responded to short-term weather and time. Consistent with the MIH, the number of ant species was best predicted by activity, particularly that of subordinate ants. Activity of dominant ants had a declining positive effect on numbers of species. Landscape position strongly predicted species composition, while long-term rainfall determined composition at genus level but not species level. Over time, species composition fluctuated, but several genera consistently increased in activity. Productivity moderators such as long-term rainfall and landscape position are key drivers of ant activity and composition in the study ecosystem, acting indirectly on numbers of species. Numbers of species were explained largely by ant activity, making a strong case for the MIH, but not competition. Longer periods of low rainfall may indirectly reduce species richness in desert ecosystems. However, a trend to increasing richness over time may indicate that conservation management can ameliorate this impact.

Date	OCT 2019
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:40
Extra	Place: Hoboken Publisher: Wiley WOS:000489288000010
Volume	88
Pages	1549-1563
Publication	Journal of Animal Ecology
DOI	10.1111/1365-2656.13052
Issue	10
Journal Abbr	J. Anim. Ecol.
ISSN	0021-8790
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Tags:

arid australia, climate, competition, desert, diversity, habitat, hymenoptera, individuals hypothesis, more individuals hypothesis, plant productivity, population-dynamics, precipitation, productivity, rainfall, species-energy relationships

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Macroecological trend of increasing values of intraspecific genetic diversity and population structure from temperate to tropical streams

Type	Journal Article
Author	Sofia Salinas-Ivanenko
Author	Cesc Murria

Abstract Aim Assuming genetic variants are selectively neutral, estimates of intraspecific genetic diversity and population structure should increase simultaneously in parallel to coalescent time, population size and gene flow. However, other processes, such as genetic drift associated with demographic fluctuations, might cause a loss of genetic diversity while not affecting population structure. In this study, we assess large-scale patterns of estimates of intraspecific genetic variation across species to determine the roles of dispersal, biogeography, divergence time and demographic fluctuations in decoupling genetic diversity and population structure. Location Pristine first-order streams distributed in seven regions from Neotropical to boreal climate, covering a gradient of habitat persistence through major biogeographical changes (e.g., Pleistocene glaciations). Time period 2008-2010. Major taxa studied Freshwater insect lineages that differ in dispersal propensity. Methods Intraspecific nucleotide diversity (pi) and population structure (phi(ST)) were estimated for 33 species using 2,128 sequences of the cox1 gene. The correlation between pi and phi(ST) was tested using linear regression models. The geographical distribution of haplotypes was represented in networks. Phylogenetic trees were time calibrated to determine divergence time. Results At a global scale, a positive relationship between pi and phi(ST) was found. Neotropical species showed the highest values of pi and phi(ST), probably owing to historical environmental stability. Across Europe, the low estimates of pi and the wide array of phi(ST) values and haplotype networks found across species, lineages and latitude were contrary to the biogeographical and dispersal paradigms. Main conclusions Beyond the macroecological trend found, genetic trajectories of co-distributed temperate species were disassociated from their functional traits and probably caused by persistent demographic fluctuations associated with local-scale habitat instability. Overall, the idiosyncratic relationship between pi and phi(ST) across species prevents the establishment of conclusive global patterns and questions the phylogeographical patterns established when studying a reduced number of co-distributed species.

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Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:15
Extra	Place: Hoboken Publisher: Wiley WOS:000662955800001
Volume	30
Pages	1685-1697
Publication	Global Ecology and Biogeography
DOI	10.1111/geb.13344
Issue	8
Journal Abbr	Glob. Ecol. Biogeogr.
ISSN	1466-822X
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Tags:

community DNA barcoding, comparative phylogeography, determinants, dispersal propensity, dispersal ability, divergence, evolution, intraspecific diversity, latitudinal gradient, latitudinal variation, long-term isolation, mitochondrial-dna, Pleistocene stability, responses, stability, stream ecology

Mechanisms underpinning climatic impacts on natural populations: altered species interactions are more important than direct effects

Type Journal Article

Author Nancy Ockendon
Author David J. Baker
Author Jamie A. Carr
Author Elizabeth C. White
Author Rosamunde E. A. Almond
Author Tatsuya Amano
Author Esther Bertram
Author Richard B. Bradbury
Author Cassie Bradley
Author Stuart H. M. Butchart
Author Nathalie Doswald
Author Wendy Foden
Author David J. C. Gill
Author Rhys E. Green
Author William J. Sutherland
Author Edmund V. J. Tanner
Author James W. Pearce-Higgins

Abstract Shifts in species' distribution and abundance in response to climate change have been well documented, but the underpinning processes are still poorly understood. We present the results of a systematic literature review and meta-analysis investigating the frequency and importance of different mechanisms by which climate has impacted natural populations. Most studies were from temperate latitudes of North America and Europe; almost half investigated bird populations. We found significantly greater support for indirect, biotic mechanisms than direct, abiotic mechanisms as mediators of the impact of climate on populations. In addition, biotic effects tended to have greater support than abiotic factors in studies of species from higher trophic levels. For primary consumers, the impact of climate was equally mediated by biotic and abiotic mechanisms, whereas for higher level consumers the mechanisms were most frequently biotic, such as predation or food availability. Biotic mechanisms were more frequently supported in studies that reported a directional trend in climate than in studies with no such climatic change, although sample sizes for this comparison were small. We call for more mechanistic studies of climate change impacts on populations, particularly in tropical systems.

Date JUL 2014
Language English
Short Title Mechanisms underpinning climatic impacts on natural populations
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:51:06
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Volume 20
Pages 2221-2229
Publication Global Change Biology
DOI 10.1111/gcb.12559

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Journal Abbr Glob. Change Biol.
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Tags:

abiotic, abundance, adaptation, biodiversity conservation, biotic, climate change, declines, dynamics, mechanism, meta-analysis, predation, productivity, range, responses, trophic level, viability

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Megafauna extinctions produce idiosyncratic Anthropocene assemblages

Type Journal Article
Author Zachary Amir
Author Jonathan H. Moore
Author Pablo Jose Negret
Author Matthew Scott Luskin
Abstract The "trophic downgrading of planet Earth" refers to the systematic decline of the world's largest vertebrates. However, our understanding of why megafauna extinction risk varies through time and the importance of site- or species-specific factors remain unclear. Here, we unravel the unexpected variability in remaining terrestrial megafauna assemblages across 10 Southeast Asian tropical forests. Consistent with global trends, every landscape experienced Holocene and/or Anthropocene megafauna extirpations, and the four most disturbed landscapes experienced 2.5 times more extirpations than the six least disturbed landscapes. However, there were no consistent size- or guild-related trends, no two tropical forests had identical assemblages, and the abundance of four species showed positive relationships with forest degradation and humans. Our results suggest that the region's megafauna assemblages are the product of a convoluted geoclimatic legacy interacting with modern disturbances and that some megafauna may persist in degraded tropical forests near settlements with sufficient poaching controls.
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Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
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Volume 8
Pages eabq2307
Publication Science Advances
DOI 10.1126/sciadv.abq2307
Issue 42
Journal Abbr Sci. Adv.
ISSN 2375-2548
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

asian elephants, borneo, defaunation, dicerorhinus-sumatrensis, forest, models, pleistocene, population-size, southeast-asia, wildlife

Attachments

- Full Text

Meta-analysis reveals declines in terrestrial but increases in freshwater insect abundances

Type	Journal Article
Author	Roel van Klink
Author	Diana E. Bowler
Author	Konstantin B. Gongalsky
Author	Ann B. Swengel
Author	Alessandro Gentile
Author	Jonathan M. Chase
Abstract	Recent case studies showing substantial declines of insect abundances have raised alarm, but how widespread such patterns are remains unclear. We compiled data from 166 long-term surveys of insect assemblages across 1676 sites to investigate trends in insect abundances over time. Overall, we found considerable variation in trends even among adjacent sites but an average decline of terrestrial insect abundance by similar to 9% per decade and an increase of freshwater insect abundance by similar to 11% per decade. Both patterns were largely driven by strong trends in North America and some European regions. We found some associations with potential drivers (e.g., land-use drivers), and trends in protected areas tended to be weaker. Our findings provide a more nuanced view of spatiotemporal patterns of insect abundance trends than previously suggested.
Date	APR 24 2020
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:26:46
Extra	Place: Washington Publisher: Amer Assoc Advancement Science WOS:000528513300043
Volume	368
Pages	417-+
Publication	Science
DOI	10.1126/science.aax9931
Issue	6489
Journal Abbr	Science
ISSN	0036-8075
Date Added	15/03/2023, 14:27:14
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Tags:

benthic macroinvertebrate assemblages, climate-change, community structure, long-term changes, population-dynamics, saproxylic beetles, soil macrofauna, spruce forests, stream, trends

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Migratory behavior and winter geography drive differential range shifts of eastern birds in response to recent climate change

Type Journal Article

Author Clark S. Rushing
Author J. Andrew Royle
Author David J. Ziolkowski
Author Keith L. Pardieck

Abstract Over the past half century, migratory birds in North America have shown divergent population trends relative to resident species, with the former declining rapidly and the latter increasing. The role that climate change has played in these observed trends is not well understood, despite significant warming over this period. We used 43 y of monitoring data to fit dynamic species distri- bution models and quantify the rate of latitudinal range shifts in 32 species of birds native to eastern North America. Since the early 1970s, species that remain in North America through- out the year, including both resident and migratory species, appear to have responded to climate change through both col- onization of suitable area at the northern leading edge of their breeding distributions and adaption in place at the southern trail- ing edges. Neotropical migrants, in contrast, have shown the opposite pattern: contraction at their southern trailing edges and no measurable shifts in their northern leading edges. As a result, the latitudinal distributions of temperate -wintering species have increased while the latitudinal distributions of neotropical migrants have decreased. These results raise important ques- tions about the mechanisms that determine range boundaries of neotropical migrants and suggest that these species may be par- ticularly vulnerable to future climate change. Our results highlight the potential importance of climate change during the nonbreed- ing season in constraining the response of migratory species to temperature changes at both the trailing and leading edges of their breeding distributions. Future research on the interactions between breeding and nonbreeding climate change is urgently needed.

Date JUN 9 2020
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:06
Extra Place: Washington Publisher: Natl Acad Sciences WOS:000545949100026
Volume 117
Pages 12897-12903
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.2000299117
Issue 23
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
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Tags:

abundance, Breeding Bird Survey, dispersal driven, impacts, migration, models, mortality, north-american birds, occupancy, occupancy modeling, poleward shifts, range shifts, site fidelity, species distribution modeling

Attachments

- Full Text

Mismatch-induced growth reductions in a clade of Arctic-breeding shorebirds are rarely mitigated by increasing temperatures

Type	Journal Article
Author	Thomas K. Lameris
Author	Pavel S. Tomkovich
Author	James A. Johnson
Author	R. I. Guy Morrison
Author	Ingrid Tulp
Author	Simeon Lisovski
Author	Lucas DeCicco
Author	Maksim Dementyev
Author	Robert E. Gill
Author	Job ten Horn
Author	Theunis Piersma
Author	Zachary Pohlen
Author	Hans Schekkerman
Author	Mikhail Soloviev
Author	Evgeny E. Syroechkovsky
Author	Mikhail K. Zhemchuzhnikov
Author	Jan A. van Gils
Abstract	In seasonal environments subject to climate change, organisms typically show phenological changes. As these changes are usually stronger in organisms at lower trophic levels than those at higher trophic levels, mismatches between consumers and their prey may occur during the consumers' reproduction period. While in some species a trophic mismatch induces reductions in offspring growth, this is not always the case. This variation may be caused by the relative strength of the mismatch, or by mitigating factors like increased temperature-reducing energetic costs. We investigated the response of chick growth rate to arthropod abundance and temperature for six populations of ecologically similar shorebirds breeding in the Arctic and sub-Arctic (four subspecies of Red Knot Calidris canutus, Great Knot C. tenuirostris and Surfbird C. virgata). In general, chicks experienced growth benefits (measured as a condition index) when hatching before the seasonal peak in arthropod abundance, and growth reductions when hatching after the peak. The moment in the season at which growth reductions occurred varied between populations, likely depending on whether food was limiting growth before or after the peak. Higher temperatures led to faster growth on average, but could only compensate for increasing trophic mismatch for the population experiencing the coldest conditions. We did not find changes in the timing of peaks in arthropod availability across the study years, possibly because our series of observations was

relatively short; timing of hatching displayed no change over the years either. Our results suggest that a trend in trophic mismatches may not yet be evident; however, we show Arctic-breeding shorebirds to be vulnerable to this phenomenon and vulnerability to depend on seasonal prey dynamics.

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Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
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Extra Place: Hoboken Publisher: Wiley WOS:000730722600001
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Tags:

arthropods, asynchrony, availability, chick growth, consequences, energy-expenditure, food, global climate-change, Great Knot, phenological mismatch, populations, Red Knot, shifts, shorebirds, Surfbird, trophic mismatch

Attachments

- Full Text

Modeling spatial variation in avian survival and residency probabilities

Type Journal Article

Author James F. Saracco
Author J. Andrew Royle
Author David F. DeSante
Author Beth Gardner

Abstract The importance of understanding spatial variation in processes driving animal population dynamics is widely recognized. Yet little attention has been paid to spatial modeling of vital rates. Here we describe a hierarchical spatial autoregressive model to provide spatially explicit year-specific estimates of apparent survival (phi) and residency (pi) probabilities from capture-recapture data. We apply the model to data collected on a declining bird species, Wood Thrush (Hylocichla mustelina), as part of a broad-scale bird-banding network, the Monitoring Avian Productivity and Survivorship (MAPS) program. The Wood Thrush analysis showed variability in both phi and pi among years and across space. Spatial heterogeneity in residency probability was particularly striking, suggesting the importance of understanding the role of transients in local populations. We found broad-scale spatial patterning in

Wood Thrush phi and pi that lend insight into population trends and can direct conservation and research. The spatial model developed here represents a significant advance over approaches to investigating spatial pattern in vital rates that aggregate data at coarse spatial scales and do not explicitly incorporate spatial information in the model. Further development and application of hierarchical capture-recapture models offers the opportunity to more fully investigate spatiotemporal variation in the processes that drive population changes.

Date	JUL 2010
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
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Extra	Place: Hoboken Publisher: Wiley WOS:000279563700002
Volume	91
Pages	1885-1891
Publication	Ecology
DOI	10.1890/09-0705.1
Issue	7
Journal Abbr	Ecology
ISSN	0012-9658
Date Added	15/03/2023, 14:28:28
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Tags:

abundance, area, capture-recapture, CAR model, Cormack-Jolly-Seber, growth, Hylocichla mustelina, MAPS program, mist netting, rates, residency, spatial autoregressive model, spatial ecology, survival estimation, transient model, transients, variability, Wood Thrush

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Modeling the status, trends, and impacts of wild bee abundance in the United States

Type	Journal Article
Author	Insu Koh
Author	Eric V. Lonsdorf
Author	Neal M. Williams
Author	Claire Brittain
Author	Rufus Isaacs
Author	Jason Gibbs
Author	Taylor H. Ricketts
Abstract	Wild bees are highly valuable pollinators. Along with managed honey bees, they provide a critical ecosystem service by ensuring stable pollination to agriculture and wild plant communities. Increasing concern about the welfare of both wild and managed pollinators, however, has prompted recent calls for national evaluation and action. Here, for the first time to our knowledge, we assess the status and trends of wild bees and their potential impacts on pollination services across the coterminous United States. We use a spatial habitat model, national land-cover data, and carefully

quantified expert knowledge to estimate wild bee abundance and associated uncertainty. Between 2008 and 2013, modeled bee abundance declined across 23% of US land area. This decline was generally associated with conversion of natural habitats to row crops. We identify 139 counties where low bee abundances correspond to large areas of pollinator-dependent crops. These areas of mismatch between supply (wild bee abundance) and demand (cultivated area) for pollination comprise 39% of the pollinator-dependent crop area in the United States. Further, we find that the crops most highly dependent on pollinators tend to experience more severe mismatches between declining supply and increasing demand. These trends, should they continue, may increase costs for US farmers and may even destabilize crop production over time. National assessments such as this can help focus both scientific and political efforts to understand and sustain wild bees. As new information becomes available, repeated assessments can update findings, revise priorities, and track progress toward sustainable management of our nation's pollinators.

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Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
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Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
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Tags:

biodiversity, components, crop pollination, declines, economic value, ecosystem services, habitat suitability, hymenoptera, land-use change, native bees, pollination services, populations, restorations, uncertainty

Attachments

- Full Text

Modelling temperature-driven changes in species associations across freshwater communities

Type Journal Article
Author Sam Wenaas Perrin
Author Bert van der Veen
Author Nick Golding

Author Anders Gravbrot Finstad

Abstract Due to global climate change-induced shifts in species distributions, estimating changes in community composition through the use of Species Distribution Models has become a key management tool. Being able to determine how species associations change along environmental gradients is likely to be pivotal in exploring the magnitude of future changes in species' distributions. This is particularly important in connectivity-limited ecosystems, such as freshwater ecosystems, where increased human translocation is creating species associations over previously unseen environmental gradients. Here, we use a large-scale presence-absence dataset of freshwater fish from lakes across the Fennoscandian region in a Joint Species Distribution Model, to measure the effect of temperature on species associations. We identified a trend of negative associations between species tolerant of cold waters and those tolerant of warmer waters, as well as positive associations between several more warm-tolerant species, with these associations often shifting depending on local temperatures. Our results confirm that freshwater ecosystems can expect to see a large-scale shift towards communities dominated by more warm-tolerant species. While there remains much work to be done to predict exactly where and when local extinctions may take place, the model implemented provides a starting-point for the exploration of climate-driven community trends. This approach is especially informative in regards to determining which species associations are most central in shaping future community composition, and which areas are most vulnerable to local extinctions.

Date JAN 2022

Language English

Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2

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Journal Abbr Glob. Change Biol.

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Tags:

climate change, climate-change, co-occurrence, eutrophication, fish, fish community, impacts, JSDMs, lakes, perch perca-fluviatilis, pike esox-lucius, populations, predictions, windermere

Attachments

- Full Text

Modelling the introduction and spread of non-native species: international trade and climate change drive ragweed invasion

Type Journal Article

Author Daniel S. Chapman
Author Laszlo Makra
Author Roberto Albertini
Author Maira Bonini
Author Anna Paldy
Author Victoria Rodinkova
Author Branko Sikoparija
Author Elzbieta Weryszko-Chmielewska
Author James M. Bullock

Abstract Biological invasions are a major driver of global change, for which models can attribute causes, assess impacts and guide management. However, invasion models typically focus on spread from known introduction points or non-native distributions and ignore the transport processes by which species arrive. Here, we developed a simulation model to understand and describe plant invasion at a continental scale, integrating repeated transport through trade pathways, unintentional release events and the population dynamics and local anthropogenic dispersal that drive subsequent spread. We used the model to simulate the invasion of Europe by common ragweed (Ambrosia artemisiifolia), a globally invasive plant that causes serious harm as an aeroallergen and crop weed. Simulations starting in 1950 accurately reproduced ragweed's current distribution, including the presence of records in climatically unsuitable areas as a result of repeated introduction. Furthermore, the model outputs were strongly correlated with spatial and temporal patterns of ragweed pollen concentrations, which are fully independent of the calibration data. The model suggests that recent trends for warmer summers and increased volumes of international trade have accelerated the ragweed invasion. For the latter, long distance dispersal because of trade within the invaded continent is highlighted as a key invasion process, in addition to import from the native range. Biosecurity simulations, whereby transport through trade pathways is halted, showed that effective control is only achieved by early action targeting all relevant pathways. We conclude that invasion models would benefit from integrating introduction processes (transport and release) with spread dynamics, to better represent propagule pressure from native sources as well as mechanisms for long-distance dispersal within invaded continents. Ultimately, such integration may facilitate better prediction of spatial and temporal variation in invasion risk and provide useful guidance for management strategies to reduce the impacts of invasion.

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Language English
Short Title Modelling the introduction and spread of non-native species
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URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
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Volume 22
Pages 3067-3079
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Tags:

ambrosia-artemisiifolia, bioeconomic model, biosecurity, colonization, common ragweed, dispersal, evolution, france, habitat, impacts, introduced species, invasive alien species, management, patterns, plant health, systems, trade pathway model

Attachments

- Accepted Version

Moisture as a determinant of habitat quality for a nonbreeding Neotropical migratory songbird

Type Journal Article

Author Joseph A. M. Smith
Author Leonard R. Reitsma
Author Peter P. Marra

Abstract Identifying the determinants of habitat quality for a species is essential for understanding how populations are limited and regulated. Spatiotemporal variation in moisture and its influence on food availability may drive patterns of habitat occupancy and demographic outcomes. Nonbreeding migratory birds in the neotropics occupy a range of habitat types that vary with respect to moisture. Using carbon isotopes and a satellite-derived measure of habitat moisture, we identified a moisture gradient across home ranges of radio-tracked Northern Waterthrush (Seiurus noveboracensis). We used this gradient to classify habitat types and to examine whether habitat moisture correlates with overwinter mass change and spring departure schedules of Northern Waterthrush over the late-winter dry season in the tropics. The two independent indicators of moisture revealed similar gradients that were directly proportional to body mass change as the dry season progressed. Birds occupying drier habitats declined in body mass over the study period, while those occupying wetter habitats increased in body mass. Regardless of habitat, birds lost an average of 7.6% of their mass at night, and mass recovery during the day trended lower in dry compared with wet habitats. This suggests that daily incremental shortfalls in mass recovery can lead to considerable season-long declines in body mass. These patterns resulted in consequences for the premigratory period, with birds occupying drier habitats having a delayed rate of fat deposition compared with those in wet habitats. Taken together with the finding that males, which are significantly larger than females, are also in better condition than females regardless of habitat suggests that high-quality habitats may be limited and that there may be competition for them. The habitat-linked variation in performance we observed suggests that habitat limitation could impact individual and population-level processes both during and in subsequent periods of the annual cycle. The linkage between moisture and habitat quality for a migratory bird indicates that the availability of high-quality habitats is dynamic due to variation in precipitation among seasons and years. Understanding this link is critical for ascertaining the

impact of future climate change, particularly in the Caribbean basin, where a much drier future is predicted.

Date	OCT 2010
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:28:26
Extra	Place: Hoboken Publisher: Wiley WOS:000282654700007
Volume	91
Pages	2874-2882
Publication	Ecology
DOI	10.1890/09-2212.1
Issue	10
Journal Abbr	Ecology
ISSN	0012-9658
Date Added	15/03/2023, 14:28:28
Modified	15/03/2023, 14:28:28

Tags:

abundance, body condition, body mass, dynamics, food, habitat quality, migratory birds, nearctic migrants, nonbreeding winter habitat, Northern Waterthrush, rainfall, Roosevelt Roads Naval Station, Puerto Rico, sampling blood, Seiurus noveboracensis, stable-carbon, warblers, winter site fidelity

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No evidence for long-term increases in biomass and stem density in the tropical rain forests of Australia

Type	Journal Article
Author	Helen T. Murphy
Author	Matt G. Bradford
Author	Alicia Dalongeville
Author	Andrew J. Ford
Author	Daniel J. Metcalfe
Abstract	Pervasive increases in biomass and stem density of tropical forests have been recorded in recent decades, potentially having significant implications for carbon storage, biodiversity and ecosystem function. This trend is widely considered to be the result of multidecadal and global scale growth stimulation arising from increases in atmospheric CO2 and temperatures. However, contrasting patterns have been recorded across the tropics, and the role of disturbance in driving biomass and stem dynamics has been highlighted as an alternative explanation. Australian tropical forests have rarely been assessed in pan-tropical analyses of long-term dynamics. We have measured recruitment, mortality and growth in 20 permanent plots in tropical forest across north-eastern Australia since 1971. We assess changes in plot level above-ground live biomass (AGB) and stem density, and compare our results with those documented over a similar time frame in the neo-tropics. No significant increase in AGB was found over the 40-year time period. Above-ground biomass tended to increase over the first two decades of the monitoring period and decrease in the final two with gain terms (growth and recruitment) lower than loss terms

(mortality) by the final decade (2000s). Stem density significantly decreased over the monitoring period with recruitment consistently lower than mortality. There was large variation in individual plots in their pattern of AGB and stem density changes over time which was consistent with the response of each plot to known disturbance events, including cyclones, pathogen outbreaks and drought. Our results are in contrast to those described for neo-tropical plots which appear to show a widespread pattern of increasing growth and stem density.Synthesis. The trend towards increasing biomass and stem density of tropical forests described for the neo-tropics does not necessarily reflect patterns in areas of the tropics where large-scale natural disturbances are relatively frequent. Australian tropical rain forests are either not increasing in productivity in response to global change, or cyclones and other regional and local mechanisms of change mask any evidence of larger-scale patterns.

Date NOV 2013
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:33
Extra Place: Hoboken Publisher: Wiley WOS:000325984300022
Volume 101
Pages 1589-1597
Publication Journal of Ecology
DOI 10.1111/1365-2745.12163
Issue 6
Journal Abbr J. Ecol.
ISSN 0022-0477
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Modified 15/03/2023, 14:29:40

Tags:

balance, carbon storage, climate change, growth, impacts, long-term monitoring, mortality, natural disturbance, neotropical forest, pervasive alteration, plant population and community dynamics, rates, recruitment, tree communities, turnover

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No net insect abundance and diversity declines across US Long Term Ecological Research sites

Type Journal Article

Author Michael S. Crossley
Author Amanda R. Meier
Author Emily M. Baldwin
Author Lauren L. Berry
Author Leah C. Crenshaw
Author Glen L. Hartman
Author Doris Lagos-Kutz
Author David H. Nichols

Author Krishna Patel
Author Sofia Varriano
Author William E. Snyder
Author Matthew D. Moran

Abstract Analysing >5,000 population abundance time series for insects and other arthropods from 68 sites within the US Long Term Ecological Research network, the authors find high variation but no overall trend in abundance and diversity among sites and taxa. Recent reports of dramatic declines in insect abundance suggest grave consequences for global ecosystems and human society. Most evidence comes from Europe, however, leaving uncertainty about insect population trends worldwide. We used >5,300 time series for insects and other arthropods, collected over 4-36 years at monitoring sites representing 68 different natural and managed areas, to search for evidence of declines across the United States. Some taxa and sites showed decreases in abundance and diversity while others increased or were unchanged, yielding net abundance and biodiversity trends generally indistinguishable from zero. This lack of overall increase or decline was consistent across arthropod feeding groups and was similar for heavily disturbed versus relatively natural sites. The apparent robustness of US arthropod populations is reassuring. Yet, this result does not diminish the need for continued monitoring and could mask subtler changes in species composition that nonetheless endanger insect-provided ecosystem services.

Date OCT 2020
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:40
Extra Place: Berlin Publisher: Nature Portfolio WOS:000558232700001
Volume 4
Pages 1368-+
Publication Nature Ecology & Evolution
DOI 10.1038/s41559-020-1269-4
Issue 10
Journal Abbr Nat. Ecol. Evol.
ISSN 2397-334X
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

forests, habitat, impact, increases, local biodiversity change, measuring beta-diversity, states, terrestrial, time-series

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Nonlinear trends in abundance and diversity and complex responses to climate change in Arctic arthropods

Type Journal Article

Author Toke T. Hoye
Author Sarah Loboda
Author Amanda M. Koltz

Author Mark A. K. Gillespie
Author Joseph J. Bowden
Author Niels M. Schmidt

Abstract Time series data on arthropod populations are critical for understanding the magnitude, direction, and drivers of change. However, most arthropod monitoring programs are short-lived and restricted in taxonomic resolution. Monitoring data from the Arctic are especially underrepresented, yet critical to uncovering and understanding some of the earliest biological responses to rapid environmental change. Clear imprints of climate on the behavior and life history of some Arctic arthropods have been demonstrated, but a synthesis of population-level abundance changes across taxa is lacking. We utilized 24 y of abundance data from Zackenberg in High-Arctic Greenland to assess trends in abundance and diversity and identify potential climatic drivers of abundance changes. Unlike findings from temperate systems, we found a nonlinear pattern, with total arthropod abundance gradually declining during 1996 to 2014, followed by a sharp increase. Family-level diversity showed the opposite pattern, suggesting increasing dominance of a small number of taxa. Total abundance masked more complicated trajectories of family-level abundance, which also frequently varied among habitats. Contrary to expectation in this extreme polar environment, winter and fall conditions and positive density-dependent feedbacks were more common determinants of arthropod dynamics than summer temperature. Together, these data highlight the complexity of characterizing climate change responses even in relatively simple Arctic food webs. Our results underscore the need for data reporting beyond overall trends in biomass or abundance and for including basic research on life history and ecology to achieve a more nuanced understanding of the sensitivity of Arctic and other arthropods to global changes.

Date JAN 12 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:42
Extra Place: Washington Publisher: Natl Acad Sciences WOS:000607277100014
Volume 118
Pages e2002557117
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.2002557117
Issue 2
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
Date Added 15/03/2023, 14:27:14
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Tags:

butterflies, declines, extrapolation, insects, landscape, long-term monitoring, phenology, plants, rarefaction, spiders, temperature, temporal trend

Attachments

- Full Text

North by north-west: climate change and directions of density shifts in birds

Type	Journal Article
Author	Aleksi Lehikoinen
Author	Raimo Virkkala
Abstract	There is increasing evidence that climate change shifts species distributions towards poles and mountain tops. However, most studies are based on presence-absence data, and either abundance or the observation effort has rarely been measured. In addition, hardly any studies have investigated the direction of shifts and factors affecting them. Here, we show using count data on a 1000km south-north gradient in Finland, that between 1970-1989 and 2000-2012, 128 bird species shifted their densities, on average, 37km towards the north north-east. The species-specific directions of the shifts in density were significantly explained by migration behaviour and habitat type. Although the temperatures have also moved on average towards the north north-east (186km), the species-specific directions of the shifts in density and temperature did not correlate due to high variation in density shifts. Findings highlight that climate change is unlikely the only driver of the direction of species density shifts, but species-specific characteristics and human land-use practices are also influencing the direction. Furthermore, the alarming results show that former climatic conditions in the north-west corner of Finland have already moved out of the country. This highlights the need for an international approach in research and conservation actions to mitigate the impacts of climate change.
Date	MAR 2016
Language	English
Short Title	North by north-west
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:08
Extra	Place: Hoboken Publisher: Wiley WOS:000370491400014
Volume	22
Pages	1121-1129
Publication	Global Change Biology
DOI	10.1111/gcb.13150
Issue	3
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

abundance, boreal birds, declines, distribution changes, distributions, ecological traits, global warming, habitat selection, land-use, monitoring censuses, poleward shifts, population trends, protected areas, range shifts, species distribution models, tracking

Attachments

- Accepted Version

Novel disturbance interactions between fire and an emerging disease impact survival and growth of resprouting trees

Type Journal Article
Author Allison B. Simler
Author Margaret R. Metz
Author Kerri M. Frangioso
Author Ross K. Meentemeyer
Author David M. Rizzo
Abstract Human-altered ecological disturbances may challenge system resilience and disrupt biological legacies maintaining ecosystem recovery. Yet, the extent to which novel regimes challenge these legacies varies. This may be partially explained by differences in the vulnerability of life history strategies to disturbance characteristics. In the fire-prone, resprouter-dominated coast redwood forests of California, the introduced disease sudden oak death (SOD) alters fuel profiles, fire behavior, and aboveground tree mortality; however, this system is dominated by resprouting trees that are well-adapted to aboveground damage, and belowground survival of individuals may represent the principal biological legacy connecting pre- and post-fire communities. Much of the research exploring altered disturbances and forest recovery has focused on legacies determined by seed dispersal and aboveground survival of adults. In this work, we use pre- and post-fire data from a long-term monitoring network to assess the impacts of novel disturbance interactions between wildfire and SOD on the belowground survival and vegetative reproduction of resprouters. We found that increasing accumulation of coarse woody surface fuels from SOD-killed hosts decreased the likelihood of belowground survival for resprouting tanoak trees, but not for redwoods. Tanoaks' belowground survival was negatively related to substrate burn severity, which increased with the volume of surface fuels from hosts, suggesting heat damage as a possible mechanism influencing altered patterns of resprouter mortality. These impacts increased with decreasing tree size. By contrast, redwood and tanoak trees that survived both disturbances resprouted more vigorously, regardless of post-fire infection by P.ramorum, and generated similar recruitment at the stand level. Our results demonstrate that disease-fire interactions can narrow recruitment filters for resprouters, which could impact long-term population and demographic structure; yet, compounded disturbance may also reduce stand density and disease pressure, allowing competitive release of survivors. Resprouters displayed vulnerabilities to altered disturbance, but our research suggests that legacies maintained by resprouting may be more resilient to certain compounded disturbances, compared to seed-obligate species, because of high rates of individual survival under increasingly severe events. These trends have important implications for conservation of declining tree species in SOD-impacted forests, as well as predictions of human impacts in other disturbance-prone systems where resprouters are present.
Date OCT 2018
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:40
Extra Place: Hoboken Publisher: Wiley WOS:000446270400010
Volume 99
Pages 2217-2229
Publication Ecology

DOI 10.1002/ecy.2493
Issue 10
Journal Abbr Ecology
ISSN 0012-9658
Date Added 15/03/2023, 14:29:40
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Tags:

arbutus-unedo, biological legacies, california, coast redwood, communities, compounded disturbance, crown fire, emerging infectious disease, forest, persistence, Phytophthora ramorum, phytophthora-ramorum, regeneration, sudden oak death, tanoak, vegetative reproduction, wildfire, woody-plants

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Nutrient addition drives declines in grassland species richness primarily via enhanced species loss

Type Journal Article

Author Andrew J. Muehleisen
Author Carmen R. E. Watkins
Author Gabriella R. Altmire
Author E. Ashley Shaw
Author Madelon F. Case
Author Lina Aoyama
Author Alejandro Brambila
Author Paul B. Reed
Author Marina LaForgia
Author Elizabeth T. Borer
Author Eric W. Seabloom
Author Jonathan D. Bakker
Author Carlos Alberto Amillas
Author Lori Biederman
Author Qingqing Chen
Author Elsa E. Cleland
Author Philip A. Fay
Author Nicole Hagenah
Author Stan Harpole
Author Yann Hautier
Author Jeremiah A. Henning
Author Johannes M. H. Knops
Author Kimberly J. Komatsu
Author Emma Ladouceur
Author Andrew MacDougall
Author Rebecca L. McCulley
Author Joslin L. Moore
Author Tim Ohlert
Author Sally A. Power

Author Carly J. Stevens
Author Peter Wilfahrt
Author Lauren M. Hallett

Abstract Declines in grassland diversity in response to nutrient addition are a general consequence of global change. This decline in species richness may be driven by multiple underlying processes operating at different time-scales. Nutrient addition can reduce diversity by enhancing the rate of local extinction via competitive exclusion, or by reducing the rate of colonization by constraining the pool of species able to colonize under new conditions. Partitioning net change into extinction and colonization rates will better delineate the long-term effect of global change in grasslands. We synthesized changes in richness in response to experimental fertilization with nitrogen, phosphorus and potassium with micronutrients across 30 grasslands. We quantified changes in local richness, colonization, and extinction over 8-10 years of nutrient addition, and compared these rates against control conditions to isolate the effect of nutrient addition from background dynamics. Total richness at steady state in the control plots was the sum of equal, relatively high rates of local colonization and extinction. On aggregate, 30%-35% of initial species were lost and the same proportion of new species were gained at least once over a decade. Absolute turnover increased with site-level richness but was proportionately greater at lower-richness sites relative to starting richness. Loss of total richness with nutrient addition, especially N in combination with P or K, was driven by enhanced rates of extinction with a smaller contribution from reduced colonization. Enhanced extinction and reduced colonization were disproportionately among native species, perennials, and forbs. Reduced colonization plateaued after the first few (<5) years after nutrient addition, while enhanced extinction continued throughout the first decade. Synthesis. Our results indicate a high rate of colonizations and extinctions underlying the richness of ambient communities and that nutrient enhancement drives overall declines in diversity primarily by exclusion of previously established species. Moreover, enhanced extinction continues over long time-scales, suggesting continuous, long-term community responses and a need for long-term study to fully realize the extinction impact of increased nutrients on grassland composition.

Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:38
Extra Place: Hoboken Publisher: Wiley WOS:000893040200001
Publication Journal of Ecology
DOI 10.1111/1365-2745.14038
Journal Abbr J. Ecol.
ISSN 0022-0477
Date Added 15/03/2023, 14:29:40
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Tags:

abundance, biodiversity, community ecology, competition, disturbance, dynamic equilibrium, grasslands, nitrogen deposition, nutrient enrichment, Nutrient Network (NutNet), plant diversity, plant population and community dynamics, resources, richness, trends, turnover

Nutrient dilution and climate cycles underlie declines in a dominant insect herbivore

Type	Journal Article
Author	Ellen A. R. Welti
Author	Karl A. Roeder
Author	Kirsten M. de Beurs
Author	Anthony Joern
Author	Michael Kaspari
Abstract	Evidence for global insect declines mounts, increasing our need to understand underlying mechanisms. We test the nutrient dilution (ND) hypothesis-the decreasing concentration of essential dietary minerals with increasing plant productivity-that particularly targets insect herbivores. Nutrient dilution can result from increased plant biomass due to climate or CO2 enrichment. Additionally, when considering long-term trends driven by climate, one must account for large-scale oscillations including El Nino Southern Oscillation (ENSO), North Atlantic Oscillation (NAO), and Pacific Decadal Oscillation (PDO). We combine long-term datasets of grasshopper abundance, climate, plant biomass, and end-of-season foliar elemental content to examine potential drivers of abundance cycles and trends of this dominant herbivore. Annual grasshopper abundances in 16- and 22-y time series from a Kansas prairie revealed both 5-y cycles and declines of 2.1-2.7%/y. Climate cycle indices of spring ENSO, summer NAO, and winter or spring PDO accounted for 40-54% of the variation in grasshopper abundance, mediated by effects of weather and host plants. Consistent with ND, grass biomass doubled and foliar concentrations of N, P, K, and Na-nutrients which limit grasshopper abundance-declined over the same period. The decline in plant nutrients accounted for 25% of the variation in grasshopper abundance over two decades. Thus a warming, wetter, more CO2-enriched world will likely contribute to declines in insect herbivores by depleting nutrients from their already nutrient-poor diet. Unlike other potential drivers of insect declines-habitat loss, light and chemical pollution-ND may be widespread in remaining natural areas.
Date	MAR 31 2020
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:26:45
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000523188100047
Volume	117
Pages	7271-7275
Publication	Proceedings of the National Academy of Sciences of the United States of America
DOI	10.1073/pnas.1920012117
Issue	13
Journal Abbr	Proc. Natl. Acad. Sci. U. S. A.
ISSN	0027-8424
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Tags:

abundance, Acrididae, biodiversity, carbon-dioxide, communities, density, elevated co2, global change, grasshopper, grassland, insect decline, population trends, scale, weather

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Ocean acidification alters the otoliths of a pantropical fish species with implications for sensory function

Type Journal Article
Author Sean Bignami
Author Ian C. Enochs
Author Derek P. Manzello
Author Su Sponaugle
Author Robert K. Cowen
Abstract Ocean acidification affects a wide diversity of marine organisms and is of particular concern for vulnerable larval stages critical to population replenishment and connectivity. Whereas it is well known that ocean acidification will negatively affect a range of calcareous taxa, the study of fishes is more limited in both depth of understanding and diversity of study species. We used new 3D microcomputed tomography to conduct in situ analysis of the impact of ocean acidification on otolith (ear stone) size and density of larval cobia (Rachycentron canadum), a large, economically important, pantropical fish species that shares many life history traits with a diversity of high-value, tropical pelagic fishes. We show that 2,100 mu atm partial pressure of carbon dioxide (pCO(2)) significantly increased not only otolith size (up to 49% greater volume and 58% greater relative mass) but also otolith density (6% higher). Estimated relative mass in 800 mu atm pCO(2) treatments was 14% greater, and there was a similar but nonsignificant trend for otolith size. Using a modeling approach, we demonstrate that these changes could affect auditory sensitivity including a similar to 50% increase in hearing range at 2,100 mu atm pCO(2), which may alter the perception of auditory information by larval cobia in a high-CO2 ocean. Our results indicate that ocean acidification has a graded effect on cobia otoliths, with the potential to substantially influence the dispersal, survival, and recruitment of a pelagic fish species. These results have important implications for population maintenance/replenishment, connectivity, and conservation efforts for other valuable fish stocks that are already being deleteriously impacted by overfishing.
Date APR 30 2013
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
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Extra Place: Washington Publisher: Natl Acad Sciences WOS:000318682300058
Volume 110
Pages 7366-7370
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.1301365110
Issue 18
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424

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Modified 15/03/2023, 14:28:28

Tags:

ability, behavior, carbon, cobia, future, growth, larvae, mass, record, sensitivity

Attachments

- Full Text

Opposing global change drivers counterbalance trends in breeding North American monarch butterflies

Type Journal Article
Author Michael S. Crossley
Author Timothy D. Meehan
Author Matthew D. Moran
Author Jeffrey Glassberg
Author William E. Snyder
Author Andrew K. Davis
Abstract Many insects are in clear decline, with monarch butterflies (Danaus plexippus) drawing particular attention as a flagship species. It is well documented that, among migratory populations, numbers of overwintering monarchs have been falling across several decades, but trends among breeding monarchs are less clear. Here, we compile >135,000 monarch observations between 1993 and 2018 from the North American Butterfly Association's annual butterfly count to examine spatiotemporal patterns and potential drivers of adult monarch relative abundance trends across the entire breeding range in eastern and western North America. While the data revealed declines at some sites, particularly the US Northeast and parts of the Midwest, numbers in other areas, notably the US Southeast and Northwest, were unchanged or increasing, yielding a slightly positive overall trend across the species range. Negative impacts of agricultural glyphosate use appeared to be counterbalanced by positive effects of annual temperature, particularly in the US Midwest. Overall, our results suggest that population growth in summer is compensating for losses during the winter and that changing environmental variables have offsetting effects on mortality and/or reproduction. We suggest that density-dependent reproductive compensation when lower numbers arrive each spring is currently able to maintain relatively stable breeding monarch numbers. However, we caution against complacency since accelerating climate change may bring growing threats. In addition, increases of summer monarchs in some regions, especially in California and in the south, may reflect replacement of migratory with resident populations. Nonetheless, it is perhaps reassuring that ubiquitous downward trends in summer monarch abundance are not evident.
Date AUG 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:22
Extra Place: Hoboken Publisher: Wiley WOS:000808492500001

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Publication Global Change Biology
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Journal Abbr Glob. Change Biol.
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Tags:

climate, conservation efforts, decline, glyphosate, insect, migration, monarch butterfly, population trends, road mortality, winter

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Parasite dynamics in North American monarchs predicted by host density and seasonal migratory culling

Type Journal Article
Author Ania A. Majewska
Author Andrew K. Davis
Author Sonia Altizer
Author Jacobus C. de Roode
Abstract Insect-pathogen dynamics can show seasonal and inter-annual variations that covary with fluctuations in insect abundance and climate. Long-term analyses are especially needed to track parasite dynamics in migratory insects, in part because their vast habitat ranges and high mobility might dampen local effects of density and climate on infection prevalence. Monarch butterflies Danaus plexippus are commonly infected with the protozoan Ophryocystis elektroscirrha (OE). Because this parasite lowers monarch survival and flight performance, and because migratory monarchs have experienced declines in recent decades, it is important to understand the patterns and drivers of infection. Here we compiled data on OE infection spanning 50 years, from wild monarchs sampled in the United States, Canada and Mexico during summer breeding, fall migrating and overwintering periods. We examined eastern versus western North American monarchs separately, to ask how abundance estimates, resource availability, climate and breeding season length impact infection trends. We further assessed the intensity of migratory culling, which occurs when infected individuals are removed from the population during migration. Average infection prevalence was four times higher in western compared to eastern subpopulations. In eastern North America, the proportion of infected monarchs increased threefold since the mid-2000s. In the western region, the proportion of infected monarchs declined sharply from 2000 to 2015, and increased thereafter. For both eastern and western subpopulations, years with greater summer adult abundance predicted greater infection prevalence, indicating that transmission increases with host breeding density. Environmental variables (temperature and NDVI) were not associated with changes in the proportion of infected adults. We found evidence for migratory culling of infected butterflies, based on declines in parasitism during fall migration. We estimated that tens of millions fewer monarchs reach overwintering sites in Mexico as a result of OE, highlighting the need to consider the parasite as a potential threat to the monarch population. Increases in infection among eastern North American monarchs post-2002 suggest that changes

to the host's ecology or environment have intensified parasite transmission. Further work is needed to examine the degree to which human practices, such as mass caterpillar rearing and the widespread planting of exotic milkweed, have contributed to this trend.

Date APR 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:55
Extra Place: Hoboken Publisher: Wiley WOS:000765599200001
Volume 91
Pages 780-793
Publication Journal of Animal Ecology
DOI 10.1111/1365-2656.13678
Issue 4
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
Date Added 15/03/2023, 14:27:14
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Tags:

animal migration, butterflies, Danaus plexippus, danaus-plexippus l, environmental change, infectious-diseases, land-use, lepidoptera, milkweed butterfly, neogregarine, Ophryocystis elektroscirrha, ophryocystis-elektroscirrha, pathogen, population abundance, protozoan parasite, seasonality, temperature, transmission

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Passerines may be sufficiently plastic to track temperature-mediated shifts in optimum lay date

Type Journal Article

Author Albert B. Phillimore
Author David I. Leech
Author James W. Pearce-Higgins
Author Jarrod D. Hadfield

Abstract Projecting the fates of populations under climate change is one of global change biology's foremost challenges. Here, we seek to identify the contributions that temperature-mediated local adaptation and plasticity make to spatial variation in nesting phenology, a phenotypic trait showing strong responses to warming. We apply a mixed modeling framework to a Britain-wide spatiotemporal dataset comprising > 100 000 records of first egg dates from four single-brooded passerine bird species. The average temperature during a specific time period (sliding window) strongly predicts spatiotemporal variation in lay date. All four species exhibit phenological plasticity, advancing lay date by 2-5 days degrees C (1). The initiation of this sliding window is delayed further north, which may be a response to a photoperiod threshold. Using clinal trends in phenology and temperature, we are able to estimate the temperature sensitivity of selection on lay date (B), but our estimates are highly sensitive to the temporal position of the sliding window. If the sliding window is of fixed duration with a start date determined by photoperiod, we find B is tracked by phenotypic plasticity. If, instead, we allow the start and duration of the sliding window to change with latitude, we find plasticity does not track B, although in this case, at odds with theoretical expectations, our estimates of B differ across latitude vs. longitude. We argue that a model combining photoperiod and mean temperature is most consistent with current understanding of phenological cues in passerines, the results from which suggest that each species could respond to projected increases in spring temperatures through plasticity alone. However, our estimates of B require further validation.

Date OCT 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:42
Extra Place: Hoboken Publisher: Wiley WOS:000386680600004
Volume 22
Pages 3259-3272
Publication Global Change Biology
DOI 10.1111/gcb.13302
Issue 10
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

breeding time, citizen science, climate, climate-change, clutch-size, cues, environmental sensitivity of selection, evolution, gene flow, great tit, local adaptation, optimum, phenology, phenotypic plasticity, plasticity, population, selection, space for time, tit parus-major

Attachments

- Full Text

Patterns of bird migration phenology in South Africa suggest northern hemisphere climate as the most consistent driver of change

Type Journal Article

Author Elsa M. S. Bussiere
Author Les G. Underhill
Author Res Altwegg

Abstract Current knowledge of phenological shifts in Palearctic bird migration is largely based on data collected on migrants at their breeding grounds; little is known about the phenology of these birds at their nonbreeding grounds, and even less about that of intra-African migrants. Because climate change patterns are not uniform across the globe, we can expect regional disparities in bird phenological responses. It is also likely that they vary across species, as species show differences in the strength of affinities they have with particular habitats and environments. Here, we examine the arrival and departure of nine Palearctic and seven intra-African migratory species in the central Highveld of South Africa, where the former spend their nonbreeding season and the latter their breeding season. Using novel analytical methods based on bird atlas data, we show phenological shifts in migration of five species - red-backed shrike, spotted flycatcher, common sandpiper, white-winged tern (Palearctic migrants), and diederik cuckoo (intra-African migrant) - between two atlas periods: 1987-1991 and 2007-2012. During this time period, Palearctic migrants advanced their departure from their South African nonbreeding grounds. This trend was mainly driven by waterbirds. No consistent changes were observed for intra-African migrants. Our results suggest that the most consistent drivers of migration phenological shifts act in the northern hemisphere, probably at the breeding grounds.

Date JUN 2015

Language English

Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2

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Volume 21

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Publication Global Change Biology

DOI 10.1111/gcb.12857

Issue 6

Journal Abbr Glob. Change Biol.

ISSN 1354-1013

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Tags:

bird migration, climate change, dates, intra-African migrants, life cycle timing, migrants, Palearctic migrants, phenological shift, population-size, South Africa, southern hemisphere, waterbirds

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Patterns of climate-induced density shifts of species: poleward shifts faster in northern boreal birds than in southern birds

Type Journal Article

Author Raimo Virkkala

Author Aleksi Lehikoinen

Abstract Climate change has been shown to cause poleward range shifts of species. These shifts are typically demonstrated using presence-absence data, which can mask the potential changes in the abundance of species. Moreover, changes in the mean centre of weighted density of species are seldom examined, and comparisons between these two methods are even rarer. Here, we studied the change in the mean weighted latitude of density (MWLD) of 94 bird species in Finland, northern Europe, using data covering a north-south gradient of over 1000km from the 1970s to the 2010s. The MWLD shifted northward on average 1.26kmyr(-1), and this shift was significantly stronger in northern species compared to southern species. These shifts can be related to climate warming during the study period, because the annual temperature had increased more in northern Finland (by 1.7 degrees C) than in southern Finland (by 1.4 degrees C), although direct causal links cannot be shown. Density shifts of species distributed over the whole country did not differ from shifts in species situated on the edge of the species range in southern and northern species. This means that density shifts occur both in the core and on the edge of species distribution. The species-specific comparison of MWLD values with corresponding changes in the mean weighted latitude using presence-absence atlas data (MWL) revealed that the MWLD moved more slowly than the MWL in the atlas data in the southern species examined, but more rapidly in the northern species. Our findings highlight that population densities are also moving rapidly towards the poles and the use of presence-absence data can mask the shift of population densities. We encourage use of abundance data in studies considering the effects of climate change on biodiversity.

Date OCT 2014
Language English
Short Title Patterns of climate-induced density shifts of species
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
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Extra Place: Hoboken Publisher: Wiley WOS:000342168500001
Volume 20
Pages 2995-3003
Publication Global Change Biology
DOI 10.1111/gcb.12573
Issue 10
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

abundance, avian community, breeding birds, consequences, density shift of species, distribution pattern, distributions, finland, global warming, habitat alteration, impacts, land-use, line transect census, long-term monitoring, population trends, protected areas, range margin

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Phenological mismatch with abiotic conditions-implications for flowering in Arctic plants

Type Journal Article
Author Helen C. Wheeler
Author Toke T. Hoye
Author Niels Martin Schmidt
Author Jens-Christian Svenning
Author Mads C. Forchhammer
Abstract Although many studies have examined the phenological mismatches between interacting organisms, few have addressed the potential for mismatches between

phenology and seasonal weather conditions. In the Arctic, rapid phenological changes in many taxa are occurring in association with earlier snowmelt. The timing of snowmelt is jointly affected by the size of the late winter snowpack and the temperature during the spring thaw. Increased winter snowpack results in delayed snowmelt, whereas higher air temperatures and faster snowmelt advance the timing of snowmelt. Where interannual variation in snowpack is substantial, changes in the timing of snowmelt can be largely uncoupled from changes in air temperature. Using detailed, long-term data on the flowering phenology of four arctic plant species from Zackenberg, Greenland, we investigate whether there is a phenological component to the temperature conditions experienced prior to and during flowering. In particular, we assess the role of timing of flowering in determining pre-flowering exposure to freezing temperatures and to the temperatures experienced prior to flowering. We then examine the implications of flowering phenology for flower abundance. Earlier snowmelt resulted in greater exposure to freezing conditions, suggesting an increased potential for a mismatch between the timing of flowering and seasonal weather conditions and an increased potential for negative consequences, such as freezing damage. We also found a parabolic relationship between the timing of flowering and the temperature experienced during flowering after taking interannual temperature effects into account. If timing of flowering advances to a cooler period of the growing season, this may moderate the effects of a general warming trend across years. Flower abundance was quadratically associated with the timing of flowering, such that both early and late flowering led to lower flower abundance than did intermediate flowering. Our results indicate that shifting the timing of flowering affects the temperature experienced during flower development and flowering beyond that imposed by interannual variations in climate. We also found that phenological timing may affect flower abundance, and hence, fitness. These findings suggest that plant population responses to future climate change will be shaped not only by extrinsic climate forcing, but also by species' phenological responses.

Date MAR 2015
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:26
Extra Place: Hoboken Publisher: Wiley WOS:000351275800017
Volume 96
Pages 775-787
Publication Ecology
DOI 10.1890/14-0338.1
Issue 3
Journal Abbr Ecology
ISSN 0012-9658
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

Cassiope tetragona, climate change, climate-change, climatic mismatch, Dryas octopetala, flowering, frost damage, Greenland, growth, Huisman-Olff-Fresco models, impacts, integrifolia, interannual variability, life-history, Papaver radicatum, phenology, population, reproductive success, responses, Salix arctica, snow-cover, snowmelt, winter, Zackenberg

Phenological trends in the pre- and post-breeding migration of long-distance migratory birds

Type Journal Article
Author Kieran B. Lawrence
Author Clive R. Barlow
Author Keith Bensusan
Author Charles Perez
Author Stephen G. Willis
Abstract Phenological mismatch is often cited as a putative driver of population declines in long-distance migratory birds. The mechanisms and cues utilized to advance breeding ground arrival will impact the adaptability of species to further warming. Furthermore, timing of post-breeding migration potentially faces diverging selective pressures, with earlier onset of tropical dry seasons favouring migration advancement, while longer growing seasons in temperate areas could facilitate delayed departures. Despite this, few studies exist of migration phenology on the non-breeding grounds or on post-breeding passage. Here, we use first arrival and last departure dates of 20 species of trans-Saharan migratory birds from tropical non-breeding grounds (The Gambia), between 1964 and 2019. Additionally, we use first arrival and last departure dates, as well as median arrival and departure dates, at an entry/departure site to/from Europe (Gibraltar), between 1991 and 2018. We assess phenological trends in pre- and post-breeding migration, as well as individual species' durations of stay in breeding and non-breeding areas. Furthermore, we assess the extent to which inter-annual variation in these timings may be explained by meteorological and ecological variables. We find significant advances in pre-breeding migration at both locations, while post-breeding migration is delayed. At Gibraltar, these trends do not differ between first/last and median dates of migration. The combination of these trends suggests substantial changes in the temporal usage of the two continents by migratory birds. Duration of stay (of species, not individuals) within Europe increased by 16 days, on average, over the 27-year monitoring period. By contrast, duration of species' stays on the non-breeding range declined by 63 days, on average, over the 56-year monitoring period. Taken together these changes suggest substantial, previously unreported alterations to annual routines in Afro-Palaearctic migrants.
Date JAN 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:32
Extra Place: Hoboken Publisher: Wiley WOS:000710295500001
Volume 28
Pages 375-389
Publication Global Change Biology
DOI 10.1111/gcb.15916
Issue 2
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34
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Tags:

africa, avian migration, climate-change, ecological conditions, Gibraltar, migrants, NAO index, ndvi, non-breeding, north-atlantic oscillation, patterns, phenological mismatch, populations, Sahel, shifts, spring arrival dates, stopover site, The Gambia, winter

Attachments

- Accepted Version

Phenology and productivity in a montane bird assemblage: Trends and responses to elevation and climate variation

Type	Journal Article
Author	James F. Saracco
Author	Rodney B. Siegel
Author	Lauren Helton
Author	Sarah L. Stock
Author	David F. Desante
Abstract	Climate variation has been linked to historical and predicted future distributions and dynamics of wildlife populations. However, demographic mechanisms underlying these changes remain poorly understood. Here, we assessed variation and trends in climate (annual snowfall and spring temperature anomalies) and avian demographic variables from mist-netting data (breeding phenology and productivity) at six sites along an elevation gradient spanning the montane zone of Yosemite National Park between 1993 and 2017. We implemented multi-species hierarchical models to relate demographic responses to elevation and climate covariates. Annual variation in climate and avian demographic variables was high. Snowfall declined (10 mm/year at the highest site, 2 mm at the lowest site), while spring temperature increased (0.045 degrees C/year) over the study period. Breeding phenology (mean first capture date of juvenile birds) advanced by 0.2 day/year (5 days); and productivity (probability of capturing a juvenile bird) increased by 0.8%/year. Breeding phenology was 12 days earlier at the lowest compared to highest site, 18 days earlier in years with lowest compared to highest snowfall anomalies, and 6 d earlier in relatively warm springs (after controlling for snowfall effects). Productivity was positively related to elevation. However, elevation-productivity responses varied among species; species with higher productivity at higher compared to lower elevations tended to be species with documented range retractions during the past century. Productivity tended to be negatively related to snowfall and was positively related to spring temperature. Overall, our results suggest that birds have tracked the variable climatic conditions in this system and have benefited from a trend toward warmer, drier springs. However, we caution that continued warming and multi-year drought or extreme weather years may alter these relationships in the future. Multi-species demographic modeling, such as implemented here, can provide an important tool for guiding conservation of species assemblages under global change.
Date	MAR 2019
Language	English
Short Title	Phenology and productivity in a montane bird assemblage
Library Catalogue	Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:50:43
Extra Place: Hoboken Publisher: Wiley WOS:000459456700017
Volume 25
Pages 985-996
Publication Global Change Biology
DOI 10.1111/gcb.14538
Issue 3
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Modified 15/03/2023, 14:51:19

Tags:

asynchrony, avian demography, california, climate, hierarchical model, impacts, MAPS program, mist-netting, mortality, phenology, population, productivity, sensitivity, shifts, Sierra Nevada, sierra-nevada, songbirds, temperature, Yosemite

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Pliocene forest dynamics as a primary driver of African bird speciation

Type Journal Article
Author Gary Voelker
Author Robert K. Outlaw
Author Rauri C. K. Bowie
Abstract Aim Montane tropics are areas of high endemism, and mechanisms driving this endemism have been receiving increasing attention at a global scale. A general trend is that climatic factors do not explain the species richness of species with small to medium-sized geographic ranges, suggesting that geological and evolutionary processes must be considered. On the African continent, several hypotheses including both refugial and geographic uplift models have been advanced to explain avian speciation and diversity in the lowland forest and montane regions of central and eastern Africa; montane regions in particular are recognized as hotspots of vertebrate endemism. Here, we examine the possible role of these models in driving speciation in a clade of African forest robins. Location Africa. Methods We constructed the first robustly supported molecular phylogenetic hypothesis of forest robins. On this phylogeny, we reconstructed habitat-based distributions and geographic distributions relative to the Albertine Rift. We also estimated the timing of lineage divergences via a molecular clock. Results Robust estimates of phylogenetic relationships and clock-based divergences reject Miocene tectonic uplift and Pleistocene forest refugia as primary drivers of speciation in forest robins. Instead, our data suggest that most forest robin speciation took place in the Late Pliocene, from 3.2 to 2.2 Ma. Distributional patterns are complex, with the Albertine Rift region serving as a general east-west break across the group. Montane distributions are inferred to have evolved four times. Main conclusions Phylogenetic divergence dates coincide with a single period of lowland forest retraction in the late Pliocene, suggesting that most montane speciation resulted from the rapid isolation of populations in montane areas, rather than montane areas themselves being drivers of speciation. This conclusion provides additional evidence that Pliocene climate change was a major driver of speciation in broadly distributed African animal

lineages. We further show that lowland forest robins are no older than their montane relatives, suggesting that lowland areas are not museums which house 'ancient' taxa; rather, for forest robins, montane areas should be viewed as living museums of a late Pliocene diversification event. A forest refugial pattern is operating in Africa, but it is not constrained to the Pleistocene.

Date JAN 2010
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:32
Extra Place: Hoboken Publisher: Wiley WOS:000272573200010
Volume 19
Pages 111-121
Publication Global Ecology and Biogeography
DOI 10.1111/j.1466-8238.2009.00500.x
Issue 1
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
Date Added 15/03/2023, 14:52:53
Modified 15/03/2023, 14:52:53

Tags:

Africa, climatic-change, dispersal, diversification, diversity, eastern arc mountains, forest robins, geographical patterns, historical biogeography, molecular systematics, montane diversification, Pliocene, refugia, speciation, species pump, species richness, vicariance

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Population collapse and retreat to fire refugia of the Tasmanian endemic conifer Athrotaxis selaginoides following the transition from Aboriginal to European fire management

Type Journal Article

Author Andres Holz
Author Sam W. Wood
Author Carly Ward
Author Thomas T. Veblen
Author David M. J. S. Bowman

Abstract Untangling the nuanced relationships between landscape, fire disturbance, human agency, and climate is key to understanding rapid population declines of fire-sensitive plant species. Using multiple lines of evidence across temporal and spatial scales (vegetation survey, stand structure analysis, dendrochronology, and fire history reconstruction), we document landscape-scale population collapse of the long-lived, endemic Tasmanian conifer Athrotaxis selaginoides in remote montane catchments in southern Tasmania. We contextualized the findings of this field-based study with a Tasmanian-wide geospatial analysis of fire-killed and unburned populations of the species. Population declines followed European colonization commencing in 1802 ad that disrupted Aboriginal landscape burning. Prior to

European colonization, fire events were infrequent but frequency sharply increased afterwards. Dendrochronological analysis revealed that reconstructed fire years were associated with abnormally warm/dry conditions, with below-average streamflow, and were strongly teleconnected to the Southern Annular Mode. The multiple fires that followed European colonization caused near total mortality of A. selaginoides and resulted in pronounced floristic, structural vegetation, and fuel load changes. Burned stands have very few regenerating A. selaginoides juveniles yet tree-establishment reconstruction of fire-killed adults exhibited persistent recruitment in the period prior to European colonization. Collectively, our findings indicate that this fire-sensitive Gondwanan conifer was able to persist with burning by Aboriginal Tasmanians, despite episodic widespread forest fires. By contrast, European burning led to the restriction of A. selaginoides to prime topographic fire refugia. Increasingly, frequent fires caused by regional dry and warming trends and increased ignitions by humans and lightning are breaching fire refugia; hence, the survival Tasmanian Gondwanan species demands sustained and targeted fire management.

Date	MAY 2020
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:39
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Volume	26
Pages	3108-3121
Publication	Global Change Biology
DOI	10.1111/gcb.15031
Issue	5
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:52:53
Modified	15/03/2023, 14:52:53

Tags:

climate change, climate modes teleconnections, climate-change, dendroecology, fire feedbacks, fire refugia, forest, forest regeneration dynamics, human-fire interactions, persistence, regimes, sensitive conifer, southern annular mode, southwest tasmania, vegetation-soil feedbacks, wilderness, wildfire

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Population density-range size relationship revisited

Type	Journal Article
Author	Maria Novosolov
Author	Gordon H. Rodda
Author	Alexandra C. North
Author	Stuart H. M. Butchart
Author	Oliver J. S. Tallowin
Author	Alison M. Gainsbury
Author	Shai Meiri

Abstract AimThe species population density-range size relationship posits that locally abundant species are widely distributed. However, this proposed pattern has been insufficiently tested. The few tests conducted were usually limited in scale and gave conflicting results. We tested the generality of the positive population density-range size relationship. We then studied whether similar environmental niche requirements are correlated with range size and with population density to search for mechanisms driving the hypothesized link between population density and range size. LocationWorldwide. MethodsWe collected data on population density, range size and environmental niche for a global dataset of 192 lizard, 893 bird and 350 mammal species. Assessing the relationship between population density and range size and environmental niche parameters, we corrected for phylogenetic relationships, body mass, diet and study area. ResultsOur findings reveal that density had a weak negative correlation with bird range size and was unrelated to lizard and mammal range size. These trends were consistent at the global scale and across the biogeographical realms. Range size was related to relatively similar environmental niche parameters in all groups. Population density, however, was explained by taxon-specific factors and was therefore unrelated to range size by common causation. Main conclusionsWe suggest that the positive relationship between population density and range size identified in previous studies might be an artefact arising through incomplete sampling of range sizes. Our results indicate that the mechanisms shaping population density and range size may be independent.

Date OCT 2017
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
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Volume 26
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Publication Global Ecology and Biogeography
DOI 10.1111/geb.12617
Issue 10
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
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Modified 15/03/2023, 14:47:34

Tags:

abundance-distribution relationship, birds, body-size, ecological rule, ecology, evolution, global land areas, lizards, local abundance, mammals, mechanisms, occupancy relationships, population density, range size, squamate reptiles

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Population trends influence species ability to track climate change

Type Journal Article
Author Joel Ralston
Author William V. Deluca
Author Richard E. Feldman

Author David I. King

Abstract Shifts of distributions have been attributed to species tracking their fundamental climate niches through space. However, several studies have now demonstrated that niche tracking is imperfect, that species' climate niches may vary with population trends, and that geographic distributions may lag behind rapid climate change. These reports of imperfect niche tracking imply shifts in species' realized climate niches. We argue that quantifying climate niche shifts and analyzing them for a suite of species reveal general patterns of niche shifts and the factors affecting species' ability to track climate change. We analyzed changes in realized climate niche between 1984 and 2012 for 46 species of North American birds in relation to population trends in an effort to determine whether species differ in the ability to track climate change and whether differences in niche tracking are related to population trends. We found that increasingly abundant species tended to show greater levels of niche expansion (climate space occupied in 2012 but not in 1980) compared to declining species. Declining species had significantly greater niche unfilling (climate space occupied in 1980 but not in 2012) compared to increasing species due to an inability to colonize new sites beyond their range peripheries after climate had changed at sites of occurrence. Increasing species, conversely, were better able to colonize new sites and therefore showed very little niche unfilling. Our results indicate that species with increasing trends are better able to geographically track climate change compared to declining species, which exhibited lags relative to changes in climate. These findings have important implications for understanding past changes in distribution, as well as modeling dynamic species distributions in the face of climate change.

Date APR 2017

Language English

Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1

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Pages 1390-1399

Publication Global Change Biology

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Issue 4

Journal Abbr Glob. Change Biol.

ISSN 1354-1013

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Tags:

abundance, biodiversity, birds, Breeding Bird Survey, change-point analysis, climate niche, distributions, envelope models, Grinellian niche, metapopulations, niche conservatism, north-american birds, poleward shifts, range margins, uncertainties

Population trends of European common birds are predicted by characteristics of their climatic niche

Type	Journal Article
Author	Frederic Jiguet
Author	Richard D. Gregory
Author	Vincent Devictor
Author	Rhys E. Green
Author	Petr Vorisek
Author	Arco Van Strien
Author	Denis Couvet
Abstract	Temperate species are projected to experience the greatest temperature increases across a range of modelled climate change scenarios, and climate warming has been linked to geographical range and population changes of individual species at such latitudes. However, beyond the multiple modelling approaches, we lack empirical evidence of contemporary climate change impacts on populations in broad taxonomic groups and at continental scales. Identifying reliable predictors of species resilience or susceptibility to climate warming is of critical importance in assessing potential risks to species, ecosystems and ecosystem services. Here we analysed long-term trends of 110 common breeding birds across Europe (20 countries), to identify climate niche characteristics, adjusted to other environmental and life history traits, that predict large-scale population changes accounting for phylogenetic relatedness among species. Beyond the now well-documented decline of farmland specialists, we found that species with the lowest thermal maxima (as the mean spring and summer temperature of the hottest part of the breeding distribution in Europe) showed the sharpest declines between 1980 and 2005. Thermal maximum predicted the recent trends independently of other potential predictors. This study emphasizes the need to account for both land-use and climate changes to assess the fate of species. Moreover, we highlight that thermal maximum appears as a reliable and simple predictor of the long-term trends of such endothermic species facing climate change.
Date	FEB 2010
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed	15/03/2023, 14:47:13
Extra	Place: Malden Publisher: Wiley-Blackwell Publishing, Inc WOS:000274419400001
Volume	16
Pages	497-505
Publication	Global Change Biology
DOI	10.1111/j.1365-2486.2009.01963.x
Issue	2
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:47:34
Modified	15/03/2023, 14:47:34

Tags:

biotic homogenization, breeding birds, climate niche, climate warming, consequences, conservation biology, declines, distributions, ecology, extinction risk, global warming, long-term trends, migratory bird, potential impacts, shifts

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Population trends of grassland birds in North America are linked to the prevalence of an agricultural epizootic in Europe

Type	Journal Article
Author	Joseph J. Nocera
Author	Hannah M. Koslowsky
Abstract	Globalization of trade has dramatic socioeconomic effects, and, intuitively, significant ecological effects should follow. However, few quantitative examples exist of the interrelationship of globalization, socioeconomics, and ecological patterns. We present a striking illustration of a cascade in which bovine spongiform encephalopathy (BSE; "mad cow disease") outbreaks in Europe exerted pressure on global beef markets, subsequently affecting North American hayfields and grassland bird populations. We examined competing models, which linked the prevalence of BSE in five focal countries, volume of beef exports to those countries from North America, and the amount of hayfield harvested and the abundance of grassland birds in North America. We found that (i) imports from North America increased 1 y after BSE outbreaks; (ii) probably because fewer cattle remained, the hay harvest in North America was reduced 2 y after the outbreak; (iii) the reduced hay harvest yielded a positive response in grassland bird populations 3 y after the outbreak.
Date	MAR 22 2011
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:27:12
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000288712200080
Volume	108
Pages	5122-5126
Publication	Proceedings of the National Academy of Sciences of the United States of America
DOI	10.1073/pnas.1018904108
Issue	12
Journal Abbr	Proc. Natl. Acad. Sci. U. S. A.
ISSN	0027-8424
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Tags:

agricultural trade, agro-ecosystems, biodiversity, bovine spongiform encephalopathy, breeding birds, cattle, conservation, corncrake crex, habitat, hay, land-use, nutritional quality, trade

Attachments

- Full Text

Population variability complicates the accurate detection of climate change responses

Type Journal Article

Author Christy McCain
Author Tim Szewczyk
Author Kevin Bracy Knight

Abstract The rush to assess species' responses to anthropogenic climate change (CC) has underestimated the importance of interannual population variability (PV). Researchers assume sampling rigor alone will lead to an accurate detection of response regardless of the underlying population fluctuations of the species under consideration. Using population simulations across a realistic, empirically based gradient in PV, we show that moderate to high PV can lead to opposite and biased conclusions about CC responses. Between pre- and post-CC sampling bouts of modeled populations as in resurvey studies, there is: (i) A 50% probability of erroneously detecting the opposite trend in population abundance change and nearly zero probability of detecting no change. (ii) Across multiple years of sampling, it is nearly impossible to accurately detect any directional shift in population sizes with even moderate PV. (iii) There is up to 50% probability of detecting a population extirpation when the species is present, but in very low natural abundances. (iv) Under scenarios of moderate to high PV across a species' range or at the range edges, there is a bias toward erroneous detection of range shifts or contractions. Essentially, the frequency and magnitude of population peaks and troughs greatly impact the accuracy of our CC response measurements. Species with moderate to high PV (many small vertebrates, invertebrates, and annual plants) may be inaccurate 'canaries in the coal mine' for CC without pertinent demographic analyses and additional repeat sampling. Variation in PV may explain some idiosyncrasies in CC responses detected so far and urgently needs more careful consideration in design and analysis of CC responses.

Date JUN 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:07
Extra Place: Hoboken Publisher: Wiley WOS:000378721700008
Volume 22
Pages 2081-2093
Publication Global Change Biology
DOI 10.1111/gcb.13211
Issue 6
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

abundance, abundance change, demography, environmental-change, extinction risk, great-basin, interannual variability, local extirpation, national-park, ochotona-princeps, population monitoring, range contractions, range shifts, small-mammal communities, species range, stochasticity

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Population- and community-level rarity have opposing effects on pollinator visitation and seed set

Type Journal Article

Author Kaitlyn S. Brown
Author Benjamin Gilbert

Abstract When can small, isolated populations overcome the negative consequences of rarity? Despite considerable effort to understand threats to rare species, few studies consider how community context alters these threats. Plant-pollinator interactions offer the opportunity to test the effect of community context on rare species success, as plant-pollinator dynamics are thought to be influenced by neighbouring plants, both through competition for pollinators (reducing success in small populations) and attraction of potential pollinators (increasing success in small populations). Here, we test these predictions by experimentally decoupling community-level rarity (relative abundance) from population-level rarity (population size) in experimental two-species fragments. We created experimental plant communities varying independently in population rarity (population size) and community rarity (relative abundance) of two annual plant species. We isolated plant roots to eliminate resource competition. We then compared the effects of population size versus relative abundance on pollinator visitation rates and an estimate of seed production. Both species had greatest pollinator visitation in large populations, but the negative effects of population rarity on visitation were partially offset when the neighbouring species was more abundant-community rarity offset the impacts of population rarity for the most common group of pollinators, solitary bees. These visitation trends impacted seed production for one species. When at low relative abundance, Polanisia dodecandra had higher seed set, matching increased visitation by solitary bees. Chamaecrista fasciculata showed no change in seed production with population- or community-level rarity. Synthesis. Our results suggest that the surrounding community can offset the negative effects of low absolute abundance on fitness when neighbouring species are more abundant, and may ultimately maintain diversity even in fragmented ecological communities.

Date SEP 2020
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:57
Extra Place: Hoboken Publisher: Wiley WOS:000530390000001
Volume 108
Pages 1835-1844
Publication Journal of Ecology
DOI 10.1111/1365-2745.13390
Issue 5
Journal Abbr J. Ecol.

ISSN 0022-0477
Date Added 15/03/2023, 14:27:14
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Tags:

abundance, Allee effects, behavior, community effect, competition, consequences, density, diversity, facilitation, fragmentation, indirect effects, persistence, plant-communities, plant-pollinator interactions, rarity, reproductive success

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Potential for redistribution of post-moult habitat for Eudyptes penguins in the Southern Ocean under future climate conditions

Type Journal Article
Author Cara-Paige Green
Author David B. Green
Author Norman Ratcliffe
Author David Thompson
Author Mary-Anne Lea
Author Alastair M. M. Baylis
Author Alexander L. Bond
Author Charles-Andre Bost
Author Sarah Crofts
Author Richard J. Cuthbert
Author Jacob Gonzalez-Solis
Author Kyle W. Morrison
Author Maud Poisbleau
Author Klemens Putz
Author Andrea Raya Rey
Author Peter G. Ryan
Author Paul M. Sagar
Author Antje Steinfurth
Author Jean-Baptiste Thiebot
Author Megan Tierney
Author Thomas Otto Whitehead
Author Simon Wotherspoon
Author Mark A. Hindell
Abstract Anthropogenic climate change is resulting in spatial redistributions of many species. We assessed the potential effects of climate change on an abundant and widely distributed group of diving birds, Eudyptes penguins, which are the main avian consumers in the Southern Ocean in terms of biomass consumption. Despite their abundance, several of these species have undergone population declines over the past century, potentially due to changing oceanography and prey availability over the important winter months. We used light-based geolocation tracking data for 485 individuals deployed between 2006 and 2020 across 10 of the major breeding locations for five taxa of Eudyptes penguins. We used boosted regression tree modelling to quantify post-moult habitat preference for southern rockhopper (E. chrysocome), eastern rockhopper (E. filholi), northern rockhopper (E. moseleyi) and

macaroni/royal (E. chrysolophus and E. schlegeli) penguins. We then modelled their redistribution under two climate change scenarios, representative concentration pathways RCP4.5 and RCP8.5 (for the end of the century, 2071-2100). As climate forcings differ regionally, we quantified redistribution in the Atlantic, Central Indian, East Indian, West Pacific and East Pacific regions. We found sea surface temperature and sea surface height to be the most important predictors of current habitat for these penguins; physical features that are changing rapidly in the Southern Ocean. Our results indicated that the less severe RCP4.5 would lead to less habitat loss than the more severe RCP8.5. The five taxa of penguin may experience a general poleward redistribution of their preferred habitat, but with contrasting effects in the (i) change in total area of preferred habitat under climate change (ii) according to geographic region and (iii) the species (macaroni/royal vs. rockhopper populations). Our results provide further understanding on the regional impacts and vulnerability of species to climate change.

Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:37
Extra	Place: Hoboken Publisher: Wiley WOS:000882562300001
Publication	Global Change Biology
DOI	10.1111/gcb.16500
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:52:53
Modified	15/03/2023, 14:52:53

Tags:

campbell-island, chrysocome-chrysocome, chrysolophus, climate change, foraging areas, habitat preference models, king penguin, marion island, migration, overwinter, population trends, predators, range, rockhopper penguins, species redistributions, Subantarctic penguins

Attachments

- Full Text

Predation is associated with variation in colour pattern, but not body shape or colour reflectance, in a rainbowfish (Melanotaenia australis)

Type	Journal Article
Author	Michael J. Young
Author	Leigh W. Simmons
Author	Jonathan P. Evans
Abstract	P>1. In freshwater fishes, inter-population variation in male phenotype is often associated with differences in predation intensity, but these effects can be difficult to disentangle from environmental influences. 2. The western rainbowfish Melanotaenia australis exhibits marked sexual dimorphism - females are plain with a slender body, while males have striking coloration and are deeper in the body. Male traits differ in expression among populations, but this has not been described or

explored in the literature. 3. This paper describes a study designed to test for geographic structuring of male phenotype in M. australis and to determine whether between-population variation in male phenotype is attributable to variation in predation regime, after accounting for environment. 4. We collected data describing habitat, and the size, activity and abundance of predators at sites containing M. australis populations. We then used photography, spectrometry and geometric morphometrics to describe colour pattern, spectral reflectance and body shape in males from these populations. Finally, we used permutation-based multivariate statistics to partition variance in these traits according to environment and predation regime. 5. Downstream environments posed higher predation risk to M. australis. Furthermore, males from these sites consistently exhibited larger cheek spots and fewer coloured lateral stripes than those from upstream sites. Variation in predation regime accounted for a significant proportion of the total variance in these traits (30 center dot 9%), after controlling for the effects of environment. 6. Variation in predation regime did not explain variation in reflectance or shape. Environmental variation, however, explained a significant portion of the total variance in reflectance (74 center dot 9%), and there was a strong trend towards it explaining a portion of the total variance in body shape (34 center dot 9%). 7. We conclude that natural selection by predators may be an important determinant of the evolution of colour pattern variation in M. australis, but not of that of body shape or colour reflectance. 8. Further study of M. australis will complement existing models, which show complex relationships between predation regime, environment and phenotype. Understanding these relationships is prerequisite to predicting the evolution of phenotypic variation in natural systems.

Date JAN 2011
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:28
Extra Place: Malden Publisher: Wiley-Blackwell Publishing, Inc WOS:000285110600018
Volume 80
Pages 183-191
Publication Journal of Animal Ecology
DOI 10.1111/j.1365-2656.2010.01759.x
Issue 1
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
Date Added 15/03/2023, 14:29:40
Modified 15/03/2023, 14:29:40

Tags:

best, distance-based linear modelling, evolution, fishes, freshwater fish, guppies poecilia-reticulata, Melanotaenia splendida australis, Melanotaeniidae, morphology, multivariate-analysis, natural-selection, north-western Australia, permutational multivariate analysis of variance, polymorphism, predation gradient, sexual selection, variance, wild guppies

Predation risk and food: opposite effects on overwintering survival and onset of breeding in a boreal rodent

Type Journal Article
Author Marko Haapakoski
Author Janne Sundell
Author Hannu Ylonen

Abstract 1. In seasonal environments, optimal onset of breeding and survival plays major roles in individual fitness. Many physiological and behavioural factors related to breeding increase the risk of predation; thus, breeding decisions should be based on current risks and benefits. According to life-history theory, if current predation risk is high and breeding itself increases the risk, it may be beneficial to postpone breeding. 2. During winter in northern hemispheres, food availability is limited and is at its lowest just prior to the onset of breeding in spring. Food constraint may lead to poor condition and reduced ability to start breeding. 3. We studied the effects of food and predation risk on winter survival and onset of breeding in a common boreal rodent, the bank vole (Myodes glareolus). In a 2 x 2 factorial experiment, we manipulated food availability (food supplemented or not) and predation risk (presence/absence of predator odour) in 20 large outdoor enclosures in central Finland. 4. Survival probabilities were highest in no predation risk treatments, whereas they were lowest in the predator risk treatment. The same trend was observed in vole densities and the weight change in individuals. Voles with food addition bred earlier than in the other treatments. 5. We conclude that during energy constrained harsh conditions in winter, predation risk causes behavioural changes throughout the winter and has significant negative survival and fitness effects for small mammals, reflected as delay in the start of breeding.

Date NOV 2012
Language English
Short Title Predation risk and food
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:37
Extra Place: Hoboken Publisher: Wiley WOS:000310554300006
Volume 81
Pages 1183-1192
Publication Journal of Animal Ecology
DOI 10.1111/j.1365-2656.2012.02005.x
Issue 6
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
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Tags:

adaptation, bank voles, behavior, fitness, indirect predation, least weasel, olfaction, population, predator stress, reproduction, stress, suppression, weasel mustela nivalis, winter

Projecting global mariculture production and adaptation pathways under climate change

Type Journal Article

Author Muhammed A. Oyinlola
Author Gabriel Reygondeau
Author Colette C. C. Wabnitz
Author Thomas L. Frolicher
Author Vicky W. Y. Lam
Author William W. L. Cheung

Abstract The sustainability of global seafood supply to meet increasing demand is facing several challenges, including increasing consumption levels due to a growing human population, fisheries resources over-exploitation and climate change. Whilst growth in seafood production from capture fisheries is limited, global mariculture production is expanding. However, climate change poses risks to the potential seafood production from mariculture. Here, we apply a global mariculture production model that accounts for changing ocean conditions, suitable marine area for farming, fishmeal and fish oil production, farmed species dietary demand, farmed fish price and global seafood demand to project mariculture production under two climate and socio-economic scenarios. We include 85 farmed marine fish and mollusc species, representing about 70% of all mariculture production in 2015. Results show positive global mariculture production changes by the mid and end of the 21(st) century relative to the 2000s under the SSP1-2.6 scenario with an increase of 17%+/- 5 and 33%+/- 6, respectively. However, under the SSP5-8.5 scenario, an increase of 8%+/- 5 is projected, with production peaking by mid-century and declining by 16%+/- 5 towards the end of the 21(st) century. More than 25% of mariculture-producing nations are projected to lose 40%-90% of their current mariculture production potential under SSP5-8.5 by mid-century. Projected impacts are mainly due to the direct ocean warming effects on farmed species and suitable marine areas, and the indirect impacts of changing availability of forage fishes supplies to produce aquafeed. Fishmeal replacement with alternative protein can lower climate impacts on a subset of finfish production. However, such adaptation measures do not apply to regions dominated by non-feed-based farming (i.e. molluscs) and regions losing substantial marine areas suitable for mariculture. Our study highlights the importance of strong mitigation efforts and the need for different climate adaptation options tailored to the diversity of mariculture systems, to support climate-resilient mariculture development.

Date FEB 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:50:56
Extra Place: Hoboken Publisher: Wiley WOS:000729541600001
Volume 28
Pages 1315-1331
Publication Global Change Biology
DOI 10.1111/gcb.15991
Issue 4
Journal Abbr Glob. Change Biol.
ISSN 1354-1013

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Tags:

aquaculture, aquafeeds, atlantic salmon, feeding 9 billion, fish farming, fish-meal replacement, fishmeal replacement, food security, food system, forage fish aquafeed, global change, oil replacement, plant protein-sources, resilience, salmon salmo-salar, trends

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Pushing the limits in marine species distribution modelling: lessons from the land present challenges and opportunities

Type Journal Article
Author L. M. Robinson
Author J. Elith
Author A. J. Hobday
Author R. G. Pearson
Author B. E. Kendall
Author H. P. Possingham
Author A. J. Richardson
Abstract Aim Species distribution models (SDMs) have been used to address a wide range of theoretical and applied questions in the terrestrial realm, but marine-based applications remain relatively scarce. In this review, we consider how conceptual and practical issues associated with terrestrial SDMs apply to a range of marine organisms and highlight the challenges relevant to improving marine SDMs. Location We include studies from both marine and terrestrial systems that encompass many geographic locations around the globe. Methods We first performed a literature search and analysis of marine and terrestrial SDMs in ISI Web of Science to assess trends and applications. Using knowledge from terrestrial applications, we critically evaluate the application of SDMs in marine systems in the context of ecological factors (dispersal, species interactions, aggregation and ontogenetic shifts) and practical considerations (data quality, alternative modelling approaches and model validation) that facilitate or create difficulties for model application. Results The relative importance of ecological factors to be considered when applying SDMs varies among terrestrial and marine organisms. Correctly incorporating dispersal is frequently considered an important issue for terrestrial models, but because there is greater potential for dispersal in the ocean, it is often less of a concern in marine SDMs. By contrast, ontogenetic shifts and feeding have received little attention in terrestrial SDM applications, but these factors are important to many marine SDMs. Opportunities also exist for applying more advanced SDM approaches in the marine realm, including mechanistic ecophysiological models, where water balance and heat transfer equations are simpler for some marine organisms relative to their terrestrial counterparts. Main conclusions SDMs have generally been under-utilized in the marine realm relative to terrestrial applications. Correlative SDM methods should be tested on a range of marine organisms, and we suggest further development of methods that address ontogenetic shifts and feeding interactions. We anticipate developments in, and cross-fertilization between, coupled correlative and process-based SDMs, mechanistic eco-physiological SDMs, and spatial population dynamic models for climate change and species invasion applications in particular. Comparisons of the

outputs of different model types will provide insight that is useful for improved spatial management of marine species.

Date	NOV 2011
Language	English
Short Title	Pushing the limits in marine species distribution modelling
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:53
Extra	Place: Hoboken Publisher: Wiley WOS:000296137400001
Volume	20
Pages	789-802
Publication	Global Ecology and Biogeography
DOI	10.1111/j.1466-8238.2010.00636.x
Issue	6
Journal Abbr	Glob. Ecol. Biogeogr.
ISSN	1466-822X
Date Added	15/03/2023, 14:52:53
Modified	15/03/2023, 14:52:53

Tags:

Aggregation, bioclimatic envelope model, biotic interactions, climate-change, competition, coral-reef fish, dispersal, ecological niche modelling, ecological theory, feeding, improve prediction, long-distance dispersal, marine/terrestrial systems, ontogenetic shifts, prey, protected areas, sample selection bias, scaling patterns, spatial-distribution, species distribution model

Attachments

- Full Text

Quantifying long-term phenological patterns of aerial insectivores roosting in the Great Lakes region using weather surveillance radar

Type	Journal Article
Author	Yuting Deng
Author	Maria Carolina T. D. Belotti
Author	Wenlong Zhao
Author	Zezhou Cheng
Author	Gustavo Perez
Author	Elske Tielens
Author	Victoria F. Simons
Author	Daniel R. Sheldon
Author	Subhransu Maji
Author	Jeffrey F. Kelly
Author	Kyle G. Horton

Abstract Organisms have been shifting their timing of life history events (phenology) in response to changes in the emergence of resources induced by climate change. Yet understanding these patterns at large scales and across long time series is often challenging. Here we used the US weather surveillance radar network to collect data on the timing of communal swallow and martin roosts and evaluate the scale of phenological shifts and its potential association with temperature. The discrete morning departures of these aggregated aerial insectivores from ground-based roosting locations are detected by radars around sunrise. For the first time, we applied a machine learning algorithm to automatically detect and track these large-scale behaviors. We used 21 years of data from 12 weather surveillance radar stations in the Great Lakes region to quantify the phenology in roosting behavior of aerial insectivores at three spatial levels: local roost cluster, radar station, and across the Great Lakes region. We show that their peak roosting activity timing has advanced by 2.26 days per decade at the regional scale. Similar signals of advancement were found at the station scale, but not at the local roost cluster scale. Air temperature trends in the Great Lakes region during the active roosting period were predictive of later stages of roosting phenology trends (75% and 90% passage dates). Our study represents one of the longest-term broad-scale phenology examinations of avian aerial insectivore species responding to environmental change and provides a stepping stone for examining potential phenological mismatches across trophic levels at broad spatial scales.

Language English

Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2

Accessed 15/03/2023, 14:51:02

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Publication Global Change Biology

DOI 10.1111/gcb.16509

Journal Abbr Glob. Change Biol.

ISSN 1354-1013

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Tags:

aerial insectivore, aeroecology, autumn migration, bird migration, birds, climate-change, declines, drivers, locations, machine learning, migration, movements, nexrad, phenology, population trends, radar remote sensing, roosts, songbird, wsr-88d

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Range-wide effects of breeding- and nonbreeding-season climate on the abundance of a Neotropical migrant songbird

Type Journal Article

Author Scott Wilson

Author Shannon L. LaDeau

Author Anders P. Tottrup

Author Peter P. Marra

Abstract Geographic variation in the population dynamics of a species can result from regional variability in climate and how it affects reproduction and survival.

Identifying such effects for migratory birds requires the integration of population models with knowledge of migratory connectivity between breeding and nonbreeding areas. We used Bayesian hierarchical models with 26 years of Breeding Bird Survey data (1982-2007) to investigate the impacts of breeding-and nonbreeding-season climate on abundance of American Redstarts (Setophaga ruticilla) across the species range. We focused on 15 populations defined by Bird Conservation Regions, and we included variation across routes and observers as well as temporal trends and climate effects. American Redstart populations that breed in eastern North America showed increased abundance following winters with higher plant productivity in the Caribbean where they are expected to overwinter. In contrast, western breeding populations showed little response to conditions in their expected wintering areas in west Mexico, perhaps reflecting lower migratory connectivity or differential effects of winter rainfall on individuals across the species range. Unlike the case with winter climate, we found few effects of temperature prior to arrival in spring (March-April) or during the nesting period (May-June) on abundance the following year. Eight populations showed significant changes in abundance, with the steepest declines in the Atlantic Northern Forest (-3.4%/ yr) and the greatest increases in the Prairie Hardwood Transition (4%/yr). This study emphasizes how the effects of climate on populations of migratory birds are context dependent and can vary depending on geographic location and the period of the annual cycle. Such knowledge is essential for predicting regional variation in how populations of a species might vary in their response to climate change.

Date SEP 2011
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:49
Extra Place: Hoboken Publisher: Wiley WOS:000294152800010
Volume 92
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Publication Ecology
DOI 10.1890/10-1757.1
Issue 9
Journal Abbr Ecology
ISSN 0012-9658
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Tags:

American Redstart, bird, Breeding Bird Survey, climate, food, habitat quality, hierarchical models, migratory connectivity, migratory songbird, ndvi, Neotropical migrant, north-american, parasitism, population dynamics, population-dynamics, rainfall, Setophaga ruticilla, success

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Rapid climate driven shifts in wintering distributions of three common waterbird species

Type Journal Article
Author Aleksi Lehikoinen

Author Kim Jaatinen
Author Anssi V. Vahatalo
Author Preben Clausen
Author Olivia Crowe
Author Bernard Deceuninckk
Author Richard Hearn
Author Chas A. Holt
Author Menno Hornman
Author Verena Keller
Author Leif Nilsson
Author Tom Langendoen
Author Irena Tomankova
Author Johannes Wahl
Author Anthony D. Fox

Abstract Climate change is predicted to cause changes in species distributions and several studies report margin range shifts in some species. However, the reported changes rarely concern a species' entire distribution and are not always linked to climate change. Here, we demonstrate strong north-eastwards shifts in the centres of gravity of the entire wintering range of three common waterbird species along the North-West Europe flyway during the past three decades. These shifts correlate with an increase of 3.8 degrees C in early winter temperature in the north-eastern part of the wintering areas, where bird abundance increased exponentially, corresponding with decreases in abundance at the south-western margin of the wintering ranges. This confirms the need to re-evaluate conservation site safeguard networks and associated biodiversity monitoring along the flyway, as new important wintering areas are established further north and east, and highlights the general urgency of conservation planning in a changing world. Range shifts in wintering waterbirds may also affect hunting pressure, which may alter bag sizes and lead to population-level consequences.

Date JUL 2013
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:50:51
Extra Place: Hoboken Publisher: Wiley WOS:000319963500008
Volume 19
Pages 2071-2081
Publication Global Change Biology
DOI 10.1111/gcb.12200
Issue 7
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

anas-crecca, birds, global warming, goldeneye, goosander, ice cover, migration, numbers, poleward shifts, population distribution, population trends, ranges, site fidelity, tufted duck, waterfowl

Rapid deep ocean deoxygenation and acidification threaten life on Northeast Pacific seamounts

Type	Journal Article
Author	Tetjana Ross
Author	Cherisse Du Preez
Author	Debby Ianson
Abstract	Anthropogenic climate change is causing our oceans to lose oxygen and become more acidic at an unprecedented rate, threatening marine ecosystems and their associated animals. In deep-sea environments, where conditions have typically changed over geological timescales, the associated animals, adapted to these stable conditions, are expected to be highly vulnerable to any change or direct human impact. Our study coalesces one of the longest deep-sea observational oceanographic time series, reaching back to the 1960s, with a modern visual survey that characterizes almost two vertical kilometers of benthic seamount ecosystems. Based on our new and rigorous analysis of the Line P oceanographic monitoring data, the upper 3,000 m of the Northeast Pacific (NEP) has lost 15% of its oxygen in the last 60 years. Over that time, the oxygen minimum zone (OMZ), ranging between approximately 480 and 1,700 m, has expanded at a rate of 3.0 +/- 0.7 m/year (due to deepening at the bottom). Additionally, carbonate saturation horizons above the OMZ have been shoaling at a rate of 1-2 m/year since the 1980s. Based on our visual surveys of four NEP seamounts, these deep-sea features support ecologically important taxa typified by long life spans, slow growth rates, and limited mobility, including habitat-forming cold water corals and sponges, echinoderms, and fish. By examining the changing conditions within the narrow realized bathymetric niches for a subset of vulnerable populations, we resolve chemical trends that are rapid in comparison to the life span of the taxa and detrimental to their survival. If these trends continue as they have over the last three to six decades, they threaten to diminish regional seamount ecosystem diversity and cause local extinctions. This study highlights the importance of mitigating direct human impacts as species continue to suffer environmental changes beyond our immediate control.
Date	NOV 2020
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:45
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Volume	26
Pages	6424-6444
Publication	Global Change Biology
DOI	10.1111/gcb.15307
Issue	11
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:52:53
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Tags:

anthropogenic co2, arm regeneration, benthic ecosystems, brittle stars, climate change, climate-change, cold water corals, declining oxygen, dissolved-oxygen, ecosystem-based management, inorganic carbon, lophelia-pertusa, ocean deoxygenation, ocean acidification, ocean biogeochemistry, oxygen minimum, sea corals, vulnerable marine ecosystems

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Rapid warming and drought negatively impact population size and reproductive dynamics of an avian predator in the arid southwest

Type Journal Article
Author Kirsten K. Cruz-McDonnell
Author Blair O. Wolf
Abstract Avian communities of arid ecosystems may be particularly vulnerable to global climate change due to the magnitude of projected change for desert regions and the inherent challenges for species residing in resource limited ecosystems. How arid-zone birds will be affected by rapid increases in air temperature and increased drought frequency and severity is poorly understood because avian responses to climate change have primarily been studied in the relatively mesic northern temperate regions. We studied the effects of increasing air temperature and aridity on a Burrowing Owl (Athene cunicularia) population in the southwestern United States from 1998 to 2013. Over 16years, the breeding population declined 98.1%, from 52 pairs to 1 pair, and nest success and fledgling output also declined significantly. These trends were strongly associated with the combined effects of decreased precipitation and increased air temperature. Arrival on the breeding grounds, pair formation, nest initiation, and hatch dates all showed significant delays ranging from 9.4 to 25.1days over 9years, which have negative effects on reproduction. Adult and juvenile body mass decreased significantly over time, with a loss of 7.9% mass in adult males and 10.9% mass in adult females over 16years, and a loss of 20.0% mass in nestlings over 8years. Taken together, these population and reproductive trends have serious implications for local population persistence. The southwestern United States has been identified as a climate change hotspot, with projections of warmer temperatures, less winter precipitation, and an increase in frequency and severity of extreme events including drought and heat waves. An increasingly warm and dry climate may contribute to this species' decline and may already be a driving force of their apparent decline in the desert southwest.
Date JAN 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:33
Extra Place: Hoboken Publisher: Wiley WOS:000367982900019
Volume 22
Pages 237-253
Publication Global Change Biology
DOI 10.1111/gcb.13092
Issue 1
Journal Abbr Glob. Change Biol.
ISSN 1354-1013

Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

Athene cunicularia, body condition, breeding phenology, Burrowing Owl, burrowing owls, climate-change, clutch-size, delayed breeding, grassland birds, kangaroo rats, kestrel falco-tinnunculus, long-term, migratory bird, nest success, population declines, precipitation, prey abundance, spring arrival

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Rapid warming is associated with population decline among terrestrial birds and mammals globally

Type Journal Article
Author Fiona E. B. Spooner
Author Richard G. Pearson
Author Robin Freeman
Abstract Animal populations have undergone substantial declines in recent decades. These declines have occurred alongside rapid, human-driven environmental change, including climate warming. An association between population declines and environmental change is well established, yet there has been relatively little analysis of the importance of the rates of climate warming and its interaction with conversion to anthropogenic land use in causing population declines. Here we present a global assessment of the impact of rapid climate warming and anthropogenic land use conversion on 987 populations of 481 species of terrestrial birds and mammals since 1950. We collated spatially referenced population trends of at least 5years' duration from the Living Planet database and used mixed effects models to assess the association of these trends with observed rates of climate warming, rates of conversion to anthropogenic land use, body mass, and protected area coverage. We found that declines in population abundance for both birds and mammals are greater in areas where mean temperature has increased more rapidly, and that this effect is more pronounced for birds. However, we do not find a strong effect of conversion to anthropogenic land use, body mass, or protected area coverage. Our results identify a link between rapid warming and population declines, thus supporting the notion that rapid climate warming is a global threat to biodiversity.
Date OCT 2018
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:04
Extra Place: Hoboken Publisher: Wiley WOS:000445728800006
Volume 24
Pages 4521-4531
Publication Global Change Biology
DOI 10.1111/gcb.14361
Issue 10
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34

Modified 15/03/2023, 14:47:34

Tags:

abundance, biodiversity, climate change, climate warming, climate-change impacts, deforestation, diversity, drivers, extinction risk, global change, habitat loss, land use change, land-use change, macroecology, population declines, trends

Attachments

- Full Text

Rare and common vertebrates span a wide spectrum of population trends

Type Journal Article
Author Gergana N. Daskalova
Author Isla H. Myers-Smith
Author John L. Godlee
Abstract The Earth's biota is changing over time in complex ways. A critical challenge is to test whether specific biomes, taxa or types of species benefit or suffer in a time of accelerating global change. We analysed nearly 10,000 abundance time series from over 2000 vertebrate species part of the Living Planet Database. We integrated abundance data with information on geographic range, habitat preference, taxonomic and phylogenetic relationships, and IUCN Red List Categories and threats. We find that 15% of populations declined, 18% increased, and 67% showed no net changes over time. Against a backdrop of no biogeographic and phylogenetic patterning in population change, we uncover a distinct taxonomic signal. Amphibians were the only taxa that experienced net declines in the analysed data, while birds, mammals and reptiles experienced net increases. Population trends were poorly captured by species' rarity and global-scale threats. Incorporation of the full spectrum of population change will improve conservation efforts to protect global biodiversity.
Date SEP 2 2020
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:38
Extra Place: Berlin Publisher: Nature Research WOS:000607085800002
Volume 11
Pages 4394
Publication Nature Communications
DOI 10.1038/s41467-020-17779-0
Issue 1
Journal Abbr Nat. Commun.
ISSN 2041-1723
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

abundance, biodiversity change, climate-change, conservation, declines, density, diversity, environments, extinction risk, resilience

Attachments

- Full Text

Rare and declining bird species benefit most from designating protected areas for conservation in the UK

Type	Journal Article
Author	A. E. Barnes
Author	J. G. Davies
Author	B. Martay
Author	P. H. Boersch-Supan
Author	S. J. Harris
Author	D. G. Noble
Author	J. W. Pearce-Higgins
Author	R. A. Robinson
Abstract	There have been recent renewed commitments to increase the extent of protected areas to combat the growing biodiversity crisis but the underpinning evidence for their effectiveness is mixed and causal connections are rarely evaluated. We used data gathered by three large-scale citizen science programmes in the UK to provide the most comprehensive assessment to date of whether national (Sites of Special Scientific Interest) and European (Special Protection Areas/Special Areas of Conservation) designated areas are associated with improved state (occurrence, abundance), change (rates of colonization, persistence and trend in abundance), community structure and, uniquely, demography (productivity) on a national avifauna, while controlling for differences in land cover, elevation and climate. We found positive associations with state that suggest these areas are well targeted and that the greatest benefit accrued to the most conservation-dependent species since positive associations with change were largely restricted to rare and declining species and habitat specialists. We suggest that increased productivity provides a plausible demographic mechanism for positive effects of designation.
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:28:16
Extra	Place: Berlin Publisher: Nature Portfolio WOS:000894460100003
Publication	Nature Ecology & Evolution
DOI	10.1038/s41559-022-01927-4
Journal Abbr	Nat. Ecol. Evol.
ISSN	2397-334X
Date Added	15/03/2023, 14:28:28
Modified	15/03/2023, 14:28:28

Tags:

biodiversity, diversity, mitigate, population, space

Attachments

- Full Text

Rates of woody encroachment in African savannas reflect water constraints and fire disturbance

Type	Journal Article
Author	Christoffer R. Axelsson
Author	Niall P. Hanan
Abstract	Aim: The aims of this study were to (1) estimate current rates of woody encroachment across African savannas; (2) identify relationships between change in woody cover and potential drivers, including water constraints, fire frequency and livestock density. The found relationships led us to pursue a third goal: (3) use temporal dynamics in woody cover to estimate potential woody cover. Location: Sub-Saharan African savannas. Methods: The study used very high spatial resolution satellite imagery at sites with overlapping older (2002-2006) and newer (2011-2016) imagery to estimate change in woody cover. We sampled 596 sites in 38 separate areas across African savannas. Areas with high anthropogenic impact were avoided in order to more clearly identify the influence of environmental factors. Relationships between woody cover change and potential drivers were identified using linear regression and simultaneous autoregression, where the latter accounts for spatial autocorrelation. Results: The mean annual change in woody cover across our study areas was 0.25% per year. Although we cannot explain the general trend of encroachment based on our data, we found that change rates were positively correlated with the difference between potential woody cover and actual woody cover (a proxy for water availability; $p<.001$), and negatively correlated with fire frequency ($p<.01$). Using the relationship between rates of encroachment and initial cover, we estimated potential woody cover at different rainfall levels. Main conclusions: The results indicate that woody encroachment is ongoing and widespread across African savannas. The fact that the difference between potential and actual cover was the most significant predictor highlights the central role of water availability and tree-tree competition in controlling change in woody populations, both in water-limited and mesic savannas. Our approach to derive potential woody cover from the woody cover change trajectories demonstrates that temporal dynamics in woody populations can be used to infer resource limitations.
Date	JUN 2018
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:39
Extra	Place: Hoboken Publisher: Wiley WOS:000435275300001
Volume	45
Pages	1209-1218
Publication	Journal of Biogeography
DOI	10.1111/jbi.13221

Issue 6
Journal Abbr J. Biogeogr.
ISSN 0305-0270
Date Added 15/03/2023, 14:29:40
Modified 15/03/2023, 14:29:40

Tags:

Africa, atmospheric co2, carbon-dioxide, change detection, consequences, cover, determinants, fire, grasslands, impact, plant encroachment, potential woody cover, responses, savanna, simultaneous autoregression, trees, very high spatial resolution imagery, water constraints, woody cover, woody encroachment

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Realized climate niche breadth varies with population trend and distribution in North American birds

Type Journal Article
Author Joel Ralston
Author William V. DeLuca
Author Richard E. Feldman
Author David I. King
Abstract AimEcological niche theory states that realized niche breadth should increase with population growth. This relationship has been studied extensively in the context of density-dependent habitat selection, and there is evidence that animal populations at higher density occupy a wider range of vegetation types. To our knowledge, no previous studies have investigated the relationship between population growth and climate niche breadth (i.e. the range of climatic conditions occupied). Here we aim to estimate the influence of population trend, as well as changes in distribution, on realized climate niche breadth. LocationNorth America. MethodsWe estimated changes in realized climate niche breadth and distribution between 1980 and 2012 for 46 bird species using data from the North American Breeding Bird Survey (BBS) and standard ecological niche modelling techniques. We analysed changes in niche breadth in relation to population trends and distributional changes from the BBS for these same species. ResultsChanges in realized climate niche breadth were significantly and positively associated with population growth, as reflected by BBS population trends, and with changes in distributional extent. Using variance partitioning, we showed that 44.2% of the variation in change in niche breadth can be explained by population trend, and that roughly half of this was independent of changes in distribution. ConclusionsRealized climate niche breadth is variable on an ecological time-scale as a function of population trend. Mechanisms associated with changes in distribution and those acting within current species range limits appear to be equally important in driving this relationship. Observed changes in niche breadth may violate distribution modelling assumptions of niche conservatism. Studying how population growth influences realized climate niche breadth is therefore important for understanding dynamic species distributions, responses to climate change and our ability to model future species distributions.
Date OCT 2016
Language English
Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:11
Extra Place: Hoboken Publisher: Wiley WOS:000383677800003
Volume 25
Pages 1173-1180
Publication Global Ecology and Biogeography
DOI 10.1111/geb.12490
Issue 10
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

abundance, Abundance, Breeding Bird Survey, declines, envelope models, Grinnellian niche, habitat selection, impacts, maxent, Maxent, package, performance, range size, software, species distribution

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Reassessing regime shifts in the North Pacific: incremental climate change and commercial fishing are necessary for explaining decadal-scale biological variability

Type Journal Article
Author Michael A. Litzow
Author Franz J. Mueter
Author Alistair J. Hobday
Abstract In areas of the North Pacific that are largely free of overfishing, climate regime shifts - abrupt changes in modes of low-frequency climate variability - are seen as the dominant drivers of decadal-scale ecological variability. We assessed the ability of leading modes of climate variability [Pacific Decadal Oscillation (PDO), North Pacific Gyre Oscillation (NPGO), Arctic Oscillation (AO), Pacific-North American Pattern (PNA), North Pacific Index (NPI), El Nino-Southern Oscillation (ENSO)] to explain decadal-scale (1965-2008) patterns of climatic and biological variability across two North Pacific ecosystems (Gulf of Alaska and Bering Sea). Our response variables were the first principle component (PC1) of four regional climate parameters [sea surface temperature (SST), sea level pressure (SLP), freshwater input, ice cover], and PCs 1-2 of 36 biological time series [production or abundance for populations of salmon (Oncorhynchus spp.), groundfish, herring (Clupea pallasii), shrimp, and jellyfish]. We found that the climate modes alone could not explain ecological variability in the study region. Both linear models (for climate PC1) and generalized additive models (for biology PC1-2) invoking only the climate modes produced residuals with significant temporal trends, indicating that the models failed to capture coherent patterns of ecological variability. However, when the residual climate trend and a time series of commercial fishery catches were used as additional candidate variables, resulting models of biology PC1-2 satisfied assumptions of independent residuals and out-performed models constructed from the climate modes alone in terms of predictive power. As measured by effect size and Akaike weights, the residual climate trend was the most important variable for explaining biology PC1 variability, and commercial catch the most important

variable for biology PC2. Patterns of climate sensitivity and exploitation history for taxa strongly associated with biology PC1-2 suggest plausible mechanistic explanations for these modeling results. Our findings suggest that, even in the absence of overfishing and in areas strongly influenced by internal climate variability, climate regime shift effects can only be understood in the context of other ecosystem perturbations.

Date	JAN 2014
Language	English
Short Title	Reassessing regime shifts in the North Pacific
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:43
Extra	Place: Hoboken Publisher: Wiley WOS:000327998600005
Volume	20
Pages	38-50
Publication	Global Change Biology
DOI	10.1111/gcb.12373
Issue	1
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:52:53
Modified	15/03/2023, 14:52:53

Tags:

alaska, Alaska, Arctic Oscillation, climate change, community reorganization, eastern bering-sea, fisheries, groundfish, large marine ecosystem, North Pacific Gyre Oscillation, North Pacific Ocean, ocean, Pacific Decadal Oscillation, pink salmon, pollock theragra-chalcogramma, recruitment, regime shift, salmon, salmon oncorhynchus-nerka

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Recent climate change is creating hotspots of butterfly increase and decline across North America

Type	Journal Article
Author	Michael S. Crossley
Author	Olivia M. Smith
Author	Lauren L. Berry
Author	Robert Phillips-Cosio
Author	Jeffrey Glassberg
Author	Kaylen M. Holman
Author	Jacquelin G. Holmquest
Author	Amanda R. Meier
Author	Sofia A. Varriano
Author	Maureen R. McClung
Author	Matthew D. Moran
Author	William E. Snyder

Abstract Some insect populations are experiencing dramatic declines, endangering the crucial ecosystem services they provide. Yet, other populations appear robust, highlighting the need to better define patterns and underlying drivers of recent change in insect numbers. We examined abundance and biodiversity trends for North American butterflies using a unique citizen-science dataset that has recorded observations of over 8 million butterflies across 456 species, 503 sites, nine ecoregions, and 26 years. Butterflies are a biodiverse group of pollinators, herbivores, and prey, making them useful bellwethers of environmental change. We found great heterogeneity in butterfly species' abundance trends, aggregating near zero, but with a tendency toward decline. There was strong spatial clustering, however, into regions of increase, decrease, or relative stasis. Recent precipitation and temperature appeared to largely drive these patterns, with butterflies generally declining at increasingly dry and hot sites but increasing at relatively wet or cool sites. In contrast, landscape and butterfly trait predictors had little influence, though abundance trends were slightly more positive around urban areas. Consistent with varying responses by different species, no overall directional change in butterfly species richness or evenness was detected. Overall, a mosaic of butterfly decay and rebound hotspots appeared to largely reflect geographic variability in climate drivers. Ongoing controversy about insect declines might dissipate with a shift in focus to the causes of heterogeneous responses among taxa and sites, with climate change emerging as a key suspect when pollinator communities are broadly impacted.

Date JUN 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:21
Extra Place: Hoboken Publisher: Wiley WOS:000631122200001
Volume 27
Pages 2702-2714
Publication Global Change Biology
DOI 10.1111/gcb.15582
Issue 12
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

biodiversity, cropland, insect conservation, pollinators, species traits

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Reduced predator species richness drives the body gigantism of a frog species on the Zhoushan Archipelago in China

Type Journal Article

Author Yiming Li
Author Feng Xu
Author Zhongwei Guo
Author Xuan Liu

Author Changnan Jin
Author Yanping Wang
Author Supen Wang

Abstract P>1. Shifts in the body size of insular vertebrates have been an interesting theme in ecological and evolutionary studies. Four primary factors, including predation pressures, resource availability, inter-species competition and immigrant selection, have been proposed to explain the trend in insular body size. Life-history theory predicts that body size, average age, the proportion of old-aged members and the density of insular populations are negatively correlated with predator species richness, and that body size and population density are positively related to resource availability. The niche expansion hypothesis argues that a positive relationship is expected to exist between insular body size and prey size, which varies in response to extinction due to small or large competitors. The immigrant hypothesis predicts that insular body size is positively correlated with distance to the mainland. 2. We tested these hypotheses by using populations of rice frogs Rana limnocharis on 20 islands in the Zhoushan Archipelago and two sites of nearby mainland China. 3. The body size (snout-vent length) of rice frogs on half of the islands was larger before and after the variable of age was controlled for; rice frog density and prey availability was higher and prey size was larger on most of the islands as compared to the two mainland sites. On the islands, the body size and other features [e.g. average age, the proportion of old-aged frogs (ages 3 and 4) and density] of the rice frogs were negatively associated with predator species richness; female body size and other features were positively associated with prey availability. The inference of multivariate linear models based on corrected Akaike Information Criterion (AIC(c)) showed that the relative importance of predator species richness on body size and each of the other features was larger than that of prey availability, prey size and distance to the mainland. In addition, the parameters for predator species richness were all negative. 4. The results provided strong support for the life-history theory of predation pressures, but weak evidence for the life-history theory of prey availability, the niche expansion or the immigrant hypothesis. The reduced predator species richness was a dominant factor contributing to the body gigantism of rice frogs on the islands.

Date JAN 2011
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:20
Extra Place: Hoboken Publisher: Wiley WOS:000285110600017

Volume 80
Pages 171-182
Publication Journal of Animal Ecology
DOI 10.1111/j.1365-2656.2010.01746.x
Issue 1
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790

Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

age structure, dimorphism, displacement, evolution, generality, insular body size, insular population, island rule, life-history, mammals, number of predator species, patterns, populations, sexual size dimorphism, size

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Region-wide changes in marine ecosystem dynamics: state-space models to distinguish trends from step changes

Type	Journal Article
Author	Matthew Spencer
Author	Nova Mieszkowska
Author	Leonie A. Robinson
Author	Stephen D. Simpson
Author	Michael T. Burrows
Author	Silvana N. R. Birchenough
Author	Eva Capasso
Author	Polly Cleall-Harding
Author	Julia Crummy
Author	Callan Duck
Author	Damien Eloire
Author	Matthew Frost
Author	Ailsa J. Hall
Author	Stephen J. Hawkins
Author	David G. Johns
Author	David W. Sims
Author	Timothy J. Smyth
Author	Chris L. J. Frid
Abstract	Regime shifts are sudden changes in ecosystem structure that can be detected across several ecosystem components. The concept that regime shifts are common in marine ecosystems has gained popularity in recent years. Many studies have searched for the step-like changes in ecosystem state expected under a simple interpretation of this idea. However, other kinds of change, such as pervasive trends, have often been ignored. We assembled over 300 ecological time series from seven UK marine regions, covering two to three decades. We developed state-space models for the first principal component of the time series in each region, a common measure of ecosystem state. Our models allowed both trends and step changes, possibly in combination. We found trends in three of seven regions and step changes in two of seven regions. Gradual and sudden changes are therefore important trajectories to consider in marine ecosystems.
Date	APR 2012
Language	English
Short Title	Region-wide changes in marine ecosystem dynamics
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:00
Extra	Place: Hoboken Publisher: Wiley WOS:000301533100006

Volume 18
Pages 1270-1281
Publication Global Change Biology
DOI 10.1111/j.1365-2486.2011.02620.x
Issue 4
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:51:19
Modified 15/03/2023, 14:51:19

Tags:

atlantic, benthos, climate variability, count data, early-warning signals, extinction, fish, long-term changes, NE Atlantic, North Sea, north-sea, phytoplankton, population-growth, regime shifts, rocky shores, seals, shifts, state-space model, time series, time-series, zooplankton

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Relationships between individual-tree mortality and water-balance variables indicate positive trends in water stress-induced tree mortality across North America

Type Journal Article
Author Robbie A. Hember
Author Werner A. Kurz
Author Nicholas C. Coops
Abstract Accounting for water stress-induced tree mortality in forest productivity models remains a challenge due to uncertainty in stress tolerance of tree populations. In this study, logistic regression models were developed to assess species- specific relationships between probability of mortality (P-m) and drought, drawing on 8.1 million observations of change in vital status (m) of individual trees across North America. Drought was defined by standardized (relative) values of soil water content (W-s,W- z) and reference evapotranspiration (ETr, z) at each field plot. The models additionally tested for interactions between the water-balance variables, aridity class of the site (AC), and estimated tree height (h). Considering drought improved model performance in 95 (80) per cent of the 64 tested species during calibration (cross-validation). On average, sensitivity to relative drought increased with site AC (i.e. aridity). Interaction between water-balance variables and estimated tree height indicated that drought sensitivity commonly decreased during early height development and increased during late height development, which may reflect expansion of the root system and decreasing whole-plant, leaf-specific hydraulic conductance, respectively. Across North America, predictions suggested that changes in the water balance caused mortality to increase from 1.1% yr(-1) in 1951 to 2.0% yr(-1) in 2014 (a net change of 0.9 +/- 0.3% yr(-1)). Interannual variation in mortality also increased, driven by increasingly severe droughts in 1988, 1998, 2006, 2007 and 2012. With strong confidence, this study indicates that water stress is a common cause of tree mortality. With weak-to-moderate confidence, this study strengthens previous claims attributing positive trends in mortality to increasing levels of water stress. This 'learn-as-we-go' approach - defined by sampling rare drought events as they continue to intensify - will help to constrain the hydraulic limits of dominant tree species and the viability of boreal and temperate forest biomes under continued climate change.

Date APR 2017
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:50
Extra Place: Hoboken Publisher: Wiley WOS:000396836800027
Volume 23
Pages 1691-1710
Publication Global Change Biology
DOI 10.1111/gcb.13428
Issue 4
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:52:53
Modified 15/03/2023, 14:52:53

Tags:

aboveground biomass, british-columbia, climate change, climate-change, douglas-fir, drought, drought-induced mortality, drought-related tree mortality, field plots, forest productivity, forest vegetation simulator, hydraulic limitation, lodgepole pine, logistic model, scots pine, tree mortality, water stress, water stress-induced tree mortality

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Relative food limitation drives geographical clutch size variation in South African passerines: a large-scale test of Ashmole's seasonality hypothesis

Type Journal Article
Author David Horak
Author Anna Toszoegyova
Author David Storch
Abstract AimTo separate the effect of overall resource level from the effect of seasonality on avian clutch size to test Ashmole's hypothesis that birds have larger clutch sizes in seasonal environments due to high per capita food availability during the breeding season. LocationSouth Africa and Lesotho. MethodsWe used a large-scale environmental gradient to test the effects of maximum resource availability and resource seasonality (estimated by the normalized difference vegetation index) on clutch size variation among local passerine assemblages (25kmx25km grid cells). The importance of maximum resource availability was distinguished from the importance of resource seasonality by using multivariate general additive models and by subsetting the data so that variation in one of these parameters was minimized. Spatial autocorrelation was controlled for by using spatial generalized least squares. ResultsAssemblage mean clutch size showed a hump-shaped relationship with maximum resource availability but an increase with resource seasonality. When the variation in maximum resource availability was fixed, clutch size increased with increasing seasonality, but it decreased with increasing maximum resource availability when we fixed the variation in seasonality. These results hold for all feeding guilds except granivores, for which we found opposite patterns. The patterns were much less pronounced when family membership was

controlled for, indicating that the overall trends are mostly driven by variation between families. Main conclusionsAlthough clutch size can be affected by many factors related to environmental productivity and its variation, Ashmole's hypothesis provides the most parsimonious explanation of the observed patterns: geographical patterns in mean clutch size across bird assemblages seem to be driven by variation of per capita food availability determined by seasonal variation of population density.

Date	APR 2015
Language	English
Short Title	Relative food limitation drives geographical clutch size variation in South African passerines
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:24
Extra	Place: Hoboken Publisher: Wiley WOS:000350997800006
Volume	24
Pages	437-447
Publication	Global Ecology and Biogeography
DOI	10.1111/geb.12261
Issue	4
Journal Abbr	Glob. Ecol. Biogeogr.
ISSN	1466-822X
Date Added	15/03/2023, 14:52:53
Modified	15/03/2023, 14:52:53

Tags:

Avian assemblages, birds, cost, David Lack, evolution, gradient, macroecological approach, normalized difference vegetation index, number of eggs, patterns, Philip Nelson Ashmole, predation, productivity, reproduction, spatial structure

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Repeat associated small RNAs vary among parents and following hybridization in maize

Type	Journal Article
Author	Wesley T. Barber
Author	Wei Zhang
Author	Hlaing Win
Author	Kranthi K. Varala
Author	Jane E. Dorweiler
Author	Matthew E. Hudson
Author	Stephen P. Moose
Abstract	Small RNAs (sRNAs) are hypothesized to contribute to hybrid vigor because they maintain genome integrity, contribute to genetic diversity, and control gene expression. We used Illumina sequencing to assess how sRNA populations vary between two maize inbred lines (B73 and Mo17) and their hybrid. We sampled sRNAs from the seedling shoot apex and the developing ear, two rapidly growing

tissues that program the greater growth of maize hybrids. We found that parental differences in siRNAs primarily originate from repeat regions. Although the maize genome contains greater number and complexity of repeats compared with Arabidopsis or rice, we confirmed that, like these simpler plant genomes, 24-nt siRNAs whose abundance differs between maize parents also show a trend of down-regulation following hybridization. Surprisingly, hybrid vigor is fully maintained when 24-nt siRNAs are globally reduced by mutation of the RNA-dependent RNA polymerase 2 encoded by modifier of paramutation1 (mop1). We also discovered that 21-22-nt siRNAs derived from a number of distinct retrotransposon families differentially accumulate between B73 and Mo17 as well as their hybrid. Thus, maize possesses a unique source of genetic variation for regulating transposons and genes at a genomic scale, which may contribute to its high degree of observed heterosis.

Date	JUN 26 2012
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:35
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000306291400072
Volume	109
Pages	10444-10449
Publication	Proceedings of the National Academy of Sciences of the United States of America
DOI	10.1073/pnas.1202073109
Issue	26
Journal Abbr	Proc. Natl. Acad. Sci. U. S. A.
ISSN	0027-8424
Date Added	15/03/2023, 14:29:40
Modified	15/03/2023, 14:29:40

Tags:

22-nucleotide RNAs, genome-wide, heterosis, hybrids, paramutation, transposon regulation, vegetative phase-change

Attachments

- Full Text

Replicated sampling increases efficiency in monitoring biological populations

Type	Journal Article
Author	Brian Dennis
Author	Jose Miguel Ponciano
Author	Mark L. Taper
Abstract	Observation or sampling error in population monitoring can cause serious degradation of the inferences, such as estimates of trend or risk, that ecologists and managers frequently seek to make with time-series observations of population abundances. We show that replicating the sampling process can considerably improve the information obtained from population monitoring. At each sampling

time the sampling method would be repeated, either simultaneously or within a short time. In this study we examine the potential value of replicated sampling to population monitoring using a density-dependent population model. We modify an existing population time-series model, the Gompertz state-space model, to incorporate replicated sampling, and we develop maximum-likelihood and restricted maximum-likelihood estimates of model parameters. Depending on sampling protocols, replication may or may not entail Substantial extra cost. Some sampling programs already have replicated samples, but the samples arc aggregated or pooled into one estimate of population abundance; such practice of aggregating samples, according to our model, loses considerable information about model parameters. The gains from replicated sampling are realized in Substantially improved statistical inferences about model parameters, especially inferences for sorting out the contributions of process noise and observation error to observed population variability.

Date FEB 2010
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:04
Extra Place: Hoboken Publisher: Wiley WOS:000275816900032
Volume 91
Pages 610-620
Publication Ecology
DOI 10.1890/08-1095.1
Issue 2
Journal Abbr Ecology
ISSN 0012-9658
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

abundance, Breeding Bird Survey, census-data, density dependence, density-dependence, ecologists, environmental noise, error, Gompertz growth model, inference, Kalman filter, measurement error, models, observation error, process noise, profile likelihood, sampling error, state-space model, stochastic population model, time-series, variability

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Resurgence of an apex marine predator and the decline in prey body size

Type Journal Article

Author Jan Ohlberger
Author Daniel E. Schindler
Author Eric J. Ward
Author Timothy E. Walsworth
Author Timothy E. Essington

Abstract In light of recent recoveries of marine mammal populations worldwide and heightened concern about their impacts on marine food webs and global fisheries, it has become increasingly important to understand the potential impacts of large marine mammal predators on prey populations and their life-history traits. In coastal waters of the northeast Pacific Ocean, marine mammals have increased in abundance over the past 40 to 50 y, including fish-eating killer whales that feed primarily on Chinook salmon. Chinook salmon, a species of high cultural and economic value, have exhibited marked declines in average size and age throughout most of their North American range. This raises the question of whether size-selective predation by marine mammals is generating these trends in life-history characteristics. Here we show that increased predation since the 1970s, but not fishery selection alone, can explain the changes in age and size structure observed for Chinook salmon populations along the west coast of North America. Simulations suggest that the decline in mean size results from the selective removal of large fish and an evolutionary shift toward faster growth and earlier maturation caused by selection. Our conclusion that intensifying predation by fish-eating killer whales contributes to the continuing decline in Chinook salmon body size points to conflicting management and conservation objectives for these two iconic species.

Date	DEC 26 2019
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:26:52
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000504656900076
Volume	116
Pages	26682-26689
Publication	Proceedings of the National Academy of Sciences of the United States of America
DOI	10.1073/pnas.1910930116
Issue	52
Journal Abbr	Proc. Natl. Acad. Sci. U. S. A.
ISSN	0027-8424
Date Added	15/03/2023, 14:27:14
Modified	15/03/2023, 14:27:14

Tags:

age, age and size structure, chinook salmon, evolutionary change, fisheries, induced evolution, life-history, life-history traits, maturity, pacific salmon, population, predation, reaction norms, salmon oncorhynchus-tshawytscha, whales orcinus-orca

Attachments

- Full Text

RivFishTIME: A global database of fish time-series to study global change ecology in riverine systems

Type	Journal Article
Author	Lise Comte
Author	Juan Carvajal-Quintero
Author	Pablo A. Tedesco

Author Xingli Giam
Author Ulrich Brose
Author Tibor Eros
Author Ana F. Filipe
Author Marie-Josee Fortin
Author Katie Irving
Author Claire Jacquet
Author Stefano Larsen
Author Sapna Sharma
Author Albert Ruhi
Author Fernando G. Becker
Author Lilian Casatti
Author Giuseppe Castaldelli
Author Renato B. Dala-Corte
Author Stephen R. Davenport
Author Nathan R. Franssen
Author Emili Garcia-Berthou
Author Anna Gavioli
Author Keith B. Gido
Author Luz Jimenez-Segura
Author Rafael P. Leitao
Author Bill McLarney
Author Jason Meador
Author Marco Milardi
Author David B. Moffatt
Author Thiago V. T. Occhi
Author Paulo S. Pompeu
Author David L. Propst
Author Mark Pyron
Author Gilberto N. Salvador
Author Jerome A. Stefferud
Author Tapio Sutela
Author Christopher Taylor
Author Akira Terui
Author Hirokazu Urabe
Author Teppo Vehanen
Author Jean R. S. Vitule
Author Jaquelini O. Zeni
Author Julian D. Olden

Abstract Motivation We compiled a global database of long-term riverine fish surveys from 46 regional and national monitoring programmes and from individual academic research efforts, with which numerous basic and applied questions in ecology and global change research can be explored. Such spatially and temporally extensive datasets have been lacking for freshwater systems in comparison to terrestrial ones. Main types of variables contained The database includes 11,386 time-series of riverine fish community catch data, including 646,270 species-specific abundance records, together with metadata related to the geographical location and sampling methodology of each time-series. Spatial location and grain The database contains 11,072 unique sampling locations (stream reach), spanning 19 countries, five

biogeographical realms and 402 hydrographical basins world-wide. Time period and grain The database encompasses the period 1951-2019. Each time-series is composed of a minimum of two yearly surveys (mean = 8 years) and represents a minimum time span of 10 years (mean = 19 years). Major taxa and level of measurement The database includes 944 species of ray-finned fishes (Class Actinopterygii). Software format csv. Main conclusion Our collective effort provides the most comprehensive long-term community database of riverine fishes to date. This unique database should interest ecologists who seek to understand the impacts of human activities on riverine fish biodiversity and to model and predict how fish communities will respond to future environmental change. Together, we hope it will promote advances in macroecological research in the freshwater realm.

Date	JAN 2021
Language	English
Short Title	RivFishTIME
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:07
Extra	Place: Hoboken Publisher: Wiley WOS:000588095000001
Volume	30
Pages	38-50
Publication	Global Ecology and Biogeography
DOI	10.1111/geb.13210
Issue	1
Journal Abbr	Glob. Ecol. Biogeogr.
ISSN	1466-822X
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

Actinopterygii, biodiversity, conservation, diversity, freshwater rivers, freshwater streams, future, patterns, population-dynamics, species abundance, temporal trends, wide, world&#8208

Attachments

- Accepted Version

Role of egg predation by haddock in the decline of an Atlantic herring population

Type	Journal Article
Author	David E. Richardson
Author	Jonathan A. Hare
Author	Michael J. Fogarty
Author	Jason S. Link
Abstract	Theoretical studies suggest that the abrupt and substantial changes in the productivity of some fisheries species may be explained by predation-driven alternate stable states in their population levels. With this hypothesis, an increase in fishing or a natural perturbation can drive a population from an upper to a lower stable-equilibrium population level. After fishing is reduced or the perturbation

ended, this low population level can persist due to the regulatory effect of the predator. Although established in theoretical studies, there is limited empirical support for predation-driven alternate stable states in exploited marine fish populations. We present evidence that egg predation by haddock (Melanogrammus aeglefinus) can cause alternate stable population levels in Georges Bank Atlantic herring (Clupea harengus). Egg predation by haddock explains a substantial decoupling of herring spawning stock biomass (an index of egg production) from observed larval herring abundance (an index of egg hatching). Estimated egg survival rates ranged from <2-70% from 1971 to 2005. A population model incorporating egg predation and herring fishing explains the major population trends of Georges Bank herring over four decades and predicts that, when the haddock population is high, seemingly conservative levels of fishing can still precipitate a severe decline in the herring population. These findings illustrate how efforts to rebuild fisheries can be undermined by not incorporating ecological interactions into fisheries models and management plans.

Date	AUG 16 2011
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:27:58
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000293895100052
Volume	108
Pages	13606-13611
Publication	Proceedings of the National Academy of Sciences of the United States of America
DOI	10.1073/pnas.1015400108
Issue	33
Journal Abbr	Proc. Natl. Acad. Sci. U. S. A.
ISSN	0027-8424
Date Added	15/03/2023, 14:28:28
Modified	15/03/2023, 14:28:28

Tags:

clupea-harengus, cod, depensation, dynamics, ecosystem, fish recruitment, fish stocks, fisheries management, gadus-morhua stock, north-sea, population dynamics, predator pit, recruitment, us continental-shelf

Attachments

- Full Text

Roles of density-dependent growth and life history evolution in accounting for fisheries-induced trait changes

Type	Journal Article
Author	Anne Maria Eikeset
Author	Erin S. Dunlop
Author	Mikko Heino

Author Geir Storvik
Author Nils C. Stenseth
Author Ulf Dieckmann

Abstract The relative roles of density dependence and life history evolution in contributing to rapid fisheries-induced trait changes remain debated. In the 1930s, northeast Arctic cod (Gadus morhua), currently the world's largest cod stock, experienced a shift from a traditional spawning-ground fishery to an industrial trawl fishery with elevated exploitation in the stock's feeding grounds. Since then, age and length at maturation have declined dramatically, a trend paralleled in other exploited stocks worldwide. These trends can be explained by demographic truncation of the population's age structure, phenotypic plasticity in maturation arising through density-dependent growth, fisheries-induced evolution favoring faster-growing or earlier-maturing fish, or a combination of these processes. Here, we use a multitrait eco-evolutionary model to assess the capacity of these processes to reproduce 74 y of historical data on age and length at maturation in northeast Arctic cod, while mimicking the stock's historical harvesting regime. Our results show that model predictions critically depend on the assumed density dependence of growth: when this is weak, life history evolution might be necessary to prevent stock collapse, whereas when a stronger density dependence estimated from recent data is used, the role of evolution in explaining fisheries-induced trait changes is diminished. Our integrative analysis of density-dependent growth, multitrait evolution, and stock-specific time series data underscores the importance of jointly considering evolutionary and ecological processes, enabling a more comprehensive perspective on empirically observed stock dynamics than previous studies could provide.

Date DEC 27 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:11
Extra Place: Washington Publisher: Natl Acad Sciences WOS:000391090800046
Volume 113
Pages 15030-15035
Publication Proceedings of the National Academy of Sciences of the United States of America
DOI 10.1073/pnas.1525749113
Issue 52
Journal Abbr Proc. Natl. Acad. Sci. U. S. A.
ISSN 0027-8424
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

atlantic cod, consequences, eco-evolutionary dynamics, eco-genetic model, fish populations, gadus-morhua, genetic adaptation, genetic variance, long-term changes, management, maturation reaction norms, northeast arctic cod, phenotypic plasticity, selective mortality, size

Attachments

- Full Text

Sampling scales define occupancy and underlying occupancy-abundance relationships in animals

Type	Journal Article
Author	Robin Steenweg
Author	Mark Hebblewhite
Author	Jesse Whittington
Author	Paul Lukacs
Author	Kevin McKelvey
Abstract	Occupancy-abundance (OA) relationships are a foundational ecological phenomenon and field of study, and occupancy models are increasingly used to track population trends and understand ecological interactions. However, these two fields of ecological inquiry remain largely isolated, despite growing appreciation of the importance of integration. For example, using occupancy models to infer trends in abundance is predicated on positive OA relationships. Many occupancy studies collect data that violate geographical closure assumptions due to the choice of sampling scales and application to mobile organisms, which may change how occupancy and abundance are related. Little research, however, has explored how different occupancy sampling designs affect OA relationships. We develop a conceptual framework for understanding how sampling scales affect the definition of occupancy for mobile organisms, which drives OA relationships. We explore how spatial and temporal sampling scales, and the choice of sampling unit (areal vs. point sampling), affect OA relationships. We develop predictions using simulations, and test them using empirical occupancy data from remote cameras on 11 medium-large mammals. Surprisingly, our simulations demonstrate that when using point sampling, OA relationships are unaffected by spatial sampling grain (i.e., cell size). In contrast, when using areal sampling (e.g., species atlas data), OA relationships are affected by spatial grain. Furthermore, OA relationships are also affected by temporal sampling scales, where the curvature of the OA relationship increases with temporal sampling duration. Our empirical results support these predictions, showing that at any given abundance, the spatial grain of point sampling does not affect occupancy estimates, but longer surveys do increase occupancy estimates. For rare species (low occupancy), estimates of occupancy will quickly increase with longer surveys, even while abundance remains constant. Our results also clearly demonstrate that occupancy for mobile species without geographical closure is not true occupancy. The independence of occupancy estimates from spatial sampling grain depends on the sampling unit. Point-sampling surveys can, however, provide unbiased estimates of occupancy for multiple species simultaneously, irrespective of home-range size. The use of occupancy for trend monitoring needs to explicitly articulate how the chosen sampling scales define occupancy and affect the occupancy-abundance relationship.
Date	JAN 2018
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:27:53
Extra	Place: Hoboken Publisher: Wiley WOS:000419240900017
Volume	99
Pages	172-183
Publication	Ecology
DOI	10.1002/ecy.2054

Issue 1
Journal Abbr Ecology
ISSN 0012-9658
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

abundance-occupancy, colonization, distribution-abundance, dynamics, ecology, estimating site occupancy, extinction, large mammals, mobile organisms, occupancy models, pattern, population, power, sampling, scale, trends

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Seasonal differentiation in density-dependent seedling survival in a tropical rain forest

Type Journal Article
Author Luxiang Lin
Author Liza S. Comita
Author Zheng Zheng
Author Min Cao
Abstract 1. Density-dependent survival is prevalent in tropical forests and is recognized as a potentially important mechanism for maintaining tree species diversity. However, there is little knowledge of how density dependence changes in fluctuating environments. 2. Across the 20-ha Xishuangbanna tropical seasonal rain forest dynamics plot in southwest China, which has distinct dry and wet seasons, we monitored seedling survival in 453 1-m2 quadrats over 2 years. Density dependence was assessed using generalized linear mixed models with crossed random effects. 3. When pooling all species at the community level, there were strong negative effects of conspecific tree neighbours on seedling survival over the dry-season, wet-season and 2-year intervals. The proportion of conspecific seedling neighbours had a significant negative effect in the dry season, but not in the wet season. 4. At the species level, the effects of conspecific tree and seedling neighbours varied widely among species in the community and were significantly positively related to population basal area in the community over the dry-season interval. In contrast, over the wet-season interval, the effects of conspecific tree and seedling neighbours did not significantly vary among species in the community. Overall community- and species-level results suggest that local-scale negative density dependence (NDD) tends to be stronger in the dry than wet season in the Xishuangbanna tropical forest. 5. At the scale of the 20-ha plot, we found a community compensatory trend (CCT), in which rare species had relatively higher seedling survival than common species in both the wet and dry seasons. A positive association between potential NDD and population basal area suggests that the CCT results from local-scale NDD, specifically because of negative effects of conspecific tree neighbours. 6. Synthesis. Our results demonstrate that the strength of density-dependent seedling survival can vary between seasons and among species in tropical forests. Future research is needed to assess the underlying mechanisms of this temporal and interspecific variation in NDD and its consequences for species coexistence and community composition.
Date JUL 2012
Language English
Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:20
Extra Place: Hoboken Publisher: Wiley WOS:000305335400007
Volume 100
Pages 905-914
Publication Journal of Ecology
DOI 10.1111/j.1365-2745.2012.01964.x
Issue 4
Journal Abbr J. Ecol.
ISSN 0022-0477
Date Added 15/03/2023, 14:29:40
Modified 15/03/2023, 14:29:40

Tags:

compensatory trend, density dependence, diversity, fog-drip, growth, Janzen-Connell hypothesis, local neighborhood, mixed models, mortality, plant-plant interactions, recruitment, species shade tolerance, tree seedlings, tropical rain forest, water, water availability, xishuangbanna

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Seed and establishment limitation contribute to long-term native forb declines in California grasslands

Type Journal Article
Author Angela J. Brandt
Author Eric W. Seabloom
Abstract The effects of exotic species invasions on biodiversity vary with spatial scale, and documentation of local-scale changes in biodiversity following invasion is generally lacking. Coupling long-term observations of local community dynamics with experiments to determine the role played by exotic species in recruitment limitation of native species would inform both our understanding of exotic impacts on natives at local scales and regional-scale management efforts to promote native persistence. We used field experimentation to quantify propagule and establishment limitation in a suite of native annual forbs in a California reserve, and compared these findings to species abundance trends within the same sites over the past 48 years. Observations at 11 paired sites (inside and outside the reserve) indicated that exotic annual plants have continued to increase in abundance over the past 48 years. This trend suggests the system has not reached equilibrium >250 years after exotic species began to spread, and 70 years after livestock grazing ceased within the reserve. Long-term monitoring observations also indicated that six native annual forb species went extinct from more local populations than were colonized. To determine the potential role of exotic species in these native plant declines, we added seed of these species into plots adjacent to monitoring sites where plant litter and live grass competition were removed. Experimental results suggest both propagule and establishment limitation have contributed to local declines observed for these native forbs. Recruitment was highest at sites that had current or historical occurrences of the seeded species, and in plots where litter was removed. Grazing history (i.e., location within or outside the reserve) interacted with exotic competition removal, such that removal of live grass competition increased recruitment in more recently grazed sites. Abundance of forbs was positively related to recruitment, while abundance of

exotic forbs was negatively related. Thus, exotic competition is likely only one factor contributing to local declines of native species in invaded ecosystems, with a combination of propagule limitation, site quality, and land use history also playing important and interactive roles in native plant recruitment.

Date	JUN 2012
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:28:16
Extra	Place: Hoboken Publisher: Wiley WOS:000305296600022
Volume	93
Pages	1451-1462
Publication	Ecology
Issue	6
Journal Abbr	Ecology
ISSN	0012-9658
Date Added	15/03/2023, 14:28:28
Modified	15/03/2023, 14:28:28

Tags:

California, USA grasslands, community assembly, competition, diversity, dominance, exotic species, impacts, invasion, livestock grazing, patterns, plant, propagule limitation, recruitment limitation, responses, species invasions, temporal variability, vegetation

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Sensitivity of salmonid freshwater life history in western US streams to future climate conditions

Type	Journal Article
Author	W. Nicholas Beer
Author	James J. Anderson
Abstract	We projected effects of mid-21st century climate on the early life growth of Chinook salmon (Oncorhynchus tshawytscha) and steelhead (O.mykiss) in western United States streams. Air temperature and snowpack trends projected from observed 20th century trends were used to predict future seasonal stream temperatures. Fish growth from winter to summer was projected with temperature-dependent models of egg development and juvenile growth. Based on temperature data from 115 sites, by mid-21st century, the effects of climate change are projected to be mixed. Fish in warm-region streams that are currently cooled by snow melt will grow less, and fish in suboptimally cool streams will grow more. Relative to 20th century conditions, by mid-21st century juvenile salmonids' weights are expected to be lower in the Columbia Basin and California Central Valley, but unchanged or greater in coastal and mountain streams. Because fish weight affects fish survival, the predicted changes in weight could impact population fitness depending on other factors such as density effects, food quality and quantity changes, habitat alterations, etc. The level of year-to-year variability in stream temperatures is high and our analysis suggests that identifying effects of climate change over the natural variability will be difficult except in a few streams.
Date	AUG 2013

Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed	15/03/2023, 14:47:29
Extra	Place: Hoboken Publisher: Wiley WOS:000328744900021
Volume	19
Pages	2547-2556
Publication	Global Change Biology
DOI	10.1111/gcb.12242
Issue	8
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:47:34
Modified	15/03/2023, 14:47:34

Tags:

bioenergetics, chinook salmon, fish, fraser-river, growth, impacts, modeling, patterns, population, salmonid, snowpack, temperature limits, time, trout, water temperature

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Sex ratio is variable and increasingly male biased at two colonies of Magellanic Penguins

Type	Journal Article
Author	Natasha J. Gownaris
Author	Pablo Garcia Borboroglu
Author	P. Dee Boersma
Abstract	Sex ratios are commonly skewed and variable in wild populations, but few studies track temporal trends in this demographic parameter. We examined variation in the operational sex ratio at two protected and declining breeding colonies of Magellanic Penguins (Spheniscus magellanicus) in Chubut, Argentina. Penguins from the two colonies, separated by 105 km, migrate north in the non-breeding season and have overlapping distributions at sea. Conditions during the non-breeding season can impact long-term trends in operational sex ratio (i.e., through sex-specific survival) and interannual variation in operational sex ratio (i.e., through sex-specific breeding decisions). We found an increasingly male-biased operational sex ratio at the two disparate colonies of Magellanic Penguins, which may contribute to continued population decline. We also found that the two colonies showed synchronous interannual variation in operational sex ratio, driven by variation in the number of females present each year. This pattern may be linked to sex-specific overwintering effects that cause females to skip breeding, i.e., to remain at sea rather than returning to the colony to breed, more often than males. Contrary to our predictions, colony-wide reproductive success was not lower in years with a more male-biased operational sex ratio. We did find that males showed more evidence of fighting and were less likely to pair when the operational sex ratio was more male biased. Our results highlight an indirect mechanism through which variation in the operational sex ratio can influence populations, through a higher incidence of fighting among the less abundant sex. Because biased sex ratios can reduce the size of the breeding

population and influence rates of conflict, tracking operational sex ratio is critical for conservation.

Date MAR 2020
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:26
Extra Place: Hoboken Publisher: Wiley WOS:000508802400001
Volume 101
Publication Ecology
DOI 10.1002/ecy.2939
Issue 3
Journal Abbr Ecology
ISSN 0012-9658
Date Added 15/03/2023, 14:29:40
Modified 15/03/2023, 14:29:40

Tags:

bird, colony monitoring, consequences, interannual variation, mate competition, mate retention, mortality, nesting density, population-growth, reproductive success, seabird, seabirds, sex ratio, skipped breeding, spatial variation, survival

Attachments

- Submitted Version

Shallow size-density relations within mammal clades suggest greater intra-guild ecological impact of large-bodied species

Type Journal Article
Author Rasmus Ostergaard Pedersen
Author Soren Faurby
Author Jens-Christian Svenning
Abstract 1. Population densities of species have a predictable relationship with their body mass on a global scale. This relationship is known as the size-density relationship (SDR). The relationship was originally found to be directly opposite of metabolic rate scaling, which led to the hypothesis of energetic equivalence. However, recent studies have suggested that the SDR varies between clades. Specifically, the SDR for certain mammal clades has been found to be less negative than the relationship across all mammals. 2. The aim of the present study is to estimate phylogenetic variation in the scaling relationship, using a data-driven identification of natural phylogenetic substructure in the body size-density relation, and discuss its potential drivers. The classic model is often used to estimate natural population densities, and a further, practical aim is to improve it by incorporating variability among phylogenetic groups. 3. We expand the model for the SDR relation of mammals to include clade-specific variation. We used a dataset with population and body mass estimates of 924 terrestrial mammal species, covering 97 families, and applied an

algorithm identifying group-specific changes in the relationship across a family-level phylogeny. 4. We show increased performance in species density estimation is achieved by incorporating clade-specific changes in the relationship compared to the classic model (increasing r(2) from .56 to .74 and Delta AIC(c) = 466). While the global SDR across clades was confirmed to be similar to previous findings (r = -.74), the relationship within all sub-clades was less negative than the overall trend. 5. Our results show that data-driven identification of phylogenetic substructure in the size-density relation substantially improves predictive accuracy of the model. The less negative relationship within clades compared to the overall trend and compared to within clade metabolic scaling suggest that the energetic equivalence rule does not hold. This relationship shows that large species within clades use proportionally more energy than smaller species. Therefore, our results are consistent with a greater intra-guild ecological impact of large-bodied species via partial monopolisation of resources by the largest species of a given guild, and hence size-asymmetric intra-guild competition.

Date	SEP 2017
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed	15/03/2023, 14:27:01
Extra	Place: Hoboken Publisher: Wiley WOS:000407320500022
Volume	86
Pages	1205-1213
Publication	Journal of Animal Ecology
DOI	10.1111/1365-2656.12701
Issue	5
Journal Abbr	J. Anim. Ecol.
ISSN	0021-8790
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Tags:

abundance, allometry, body size, body-size, carnivores, Cope's rule, copes rule, energetic equivalence, evolution, explanation, extinction, interference competition, intra-guild competition, mammals, population-density

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Shared functional traits explain synchronous changes in long-term count trends of migratory raptors

Type	Journal Article
Author	Patricia Kaye T. Dumandan
Author	Keith L. Bildstein
Author	Laurie J. Goodrich
Author	Andrii Zaiats
Author	T. Trevor Caughlin
Author	Todd E. Katzner

Abstract Aim Assessing long-term shifts in faunal assemblages is important to understand the consequences of ongoing global environmental change. One approach to assess drivers of assemblage changes is to identify the traits associated with synchronous shifts in count trends among species. Our research identified traits influencing trends in 73 years of count data on migrating raptors recorded in the north-eastern USA. Location Pennsylvania, USA. Time period 1946-2018. Major taxa studied Birds of prey/raptors. Methods Migrating raptors were counted during autumn, following a standardized protocol. We used a hierarchical breakpoint model to identify when count trends shifted and to assess the role of traits in driving these trends before and after the breakpoint. Specifically, we quantified the probability of the direction (PD) of an effect of body mass, habitat or dietary specialization, migratory behaviour and susceptibility to dichlorodiphenyltrichloroethane (DDT) on count trends. Results We documented an assemblage-wide mean shift in count trends of migrating raptors in 1974. In general, species that exhibited negative count trends before the breakpoint exhibited positive count trends afterwards. We found that traits associated with resource use (diet and habitat specialization) had high probabilities of affecting count trends, pre- and post-breakpoint (> 90%). Moreover, the direction of their effects differed during both periods. Unexpectedly, other traits we evaluated, including DDT susceptibility, had relatively weaker associations with count trends. Main conclusions Trait-based frameworks have promise for testing generalized assumptions about drivers of population trajectories. Historically, DDT was considered a key driver of changes in raptor population trends. However, our analysis suggests that other factors were also relevant. Moreover, the positive association between count trends and generalist behaviour depended on the temporal context. This result has implications for other settings where demographic trends can be linked to traits and help to identify drivers of biodiversity change.

Date MAR 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:21
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Volume 30
Pages 640-650
Publication Global Ecology and Biogeography
DOI 10.1111/geb.13242
Issue 3
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
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Tags:

biodiversity, birds, breakpoint model, community ecology, decline, eastern USA, evolution, global environmental change, impacts, models, north&#8208, population-change, regression, risk, species assemblages, traits

Shrub persistence and increased grass mortality in response to drought in dryland systems

Type	Journal Article
Author	Daniel E. Winkler
Author	Jayne Belnap
Author	David Hoover
Author	Sasha C. Reed
Author	Michael C. Duniway
Abstract	Droughts in the southwest United States have led to major forest and grassland die-off events in recent decades, suggesting plant community and ecosystem shifts are imminent as native perennial grass populations are replaced by shrub- and invasive plant-dominated systems. These patterns are similar to those observed in arid and semiarid systems around the globe, but our ability to predict which species will experience increased drought-induced mortality in response to climate change remains limited. We investigated meteorological drought-induced mortality of nine dominant plant species in the Colorado Plateau Desert by experimentally imposing a year-round 35% precipitation reduction for eight continuous years. We distributed experimental plots across numerous plant, soil, and parent material types, resulting in 40 distinct sites across a 4,500 km(2) region of the Colorado Plateau Desert. For all 8 years, we tracked c. 400 individual plants and evaluated mortality responses to treatments within and across species, and through time. We also examined the influence of abiotic and biotic site factors in driving mortality responses. Overall, high mortality trends were driven by dominant grass species, including Achnatherum hymenoides, Pleuraphis jamesii, and Sporobolus cryptandrus. Responses varied widely from year to year and dominant shrub species were generally resistant to meteorological drought, likely due to their ability to access deeper soil water. Importantly, mortality increased in the presence of invasive species regardless of treatment, and native plant die-off occurred even under ambient conditions, suggesting that recent climate changes are already negatively impacting dominant species in these systems. Results from this long-term drought experiment suggest major shifts in community composition and, as a result, ecosystem function. Patterns also show that, across multiple soil and plant community types, native perennial grass species may be replaced by shrubs and invasive annuals in the Colorado Plateau Desert.
Date	SEP 2019
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:18
Extra	Place: Hoboken Publisher: Wiley WOS:000478644100021
Volume	25
Pages	3121-3135
Publication	Global Change Biology
DOI	10.1111/gcb.14667
Issue	9
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
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Tags:

Bromus tectorum, cheatgrass, climate change, climate-change, colorado plateau, die-off, ecological restoration, graminoids, grass, land-use, model selection, parent material, perennials, populations, rooting depth, Salsola, shrubs, tree mortality, vegetation change, woody plant mortality

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Similarities in butterfly emergence dates among populations suggest local adaptation to climate

Type Journal Article

Author David B. Roy
Author Tom H. Oliver
Author Marc S. Botham
Author Bjorn Beckmann
Author Tom Brereton
Author Roger L. H. Dennis
Author Colin Harrower
Author Albert B. Phillimore
Author Jeremy A. Thomas

Abstract Phenology shifts are the most widely cited examples of the biological impact of climate change, yet there are few assessments of potential effects on the fitness of individual organisms or the persistence of populations. Despite extensive evidence of climate-driven advances in phenological events over recent decades, comparable patterns across species' geographic ranges have seldom been described. Even fewer studies have quantified concurrent spatial gradients and temporal trends between phenology and climate. Here we analyse a large data set (similar to 129 000 phenology measures) over 37 years across the UK to provide the first phylogenetic comparative analysis of the relative roles of plasticity and local adaptation in generating spatial and temporal patterns in butterfly mean flight dates. Although populations of all species exhibit a plastic response to temperature, with adult emergence dates earlier in warmer years by an average of 6.4 days per degrees C, among-population differences are significantly lower on average, at 4.3 days per degrees C. Emergence dates of most species are more synchronised over their geographic range than is predicted by their relationship between mean flight date and temperature over time, suggesting local adaptation. Biological traits of species only weakly explained the variation in differences between space-temperature and time-temperature phenological responses, suggesting that multiple mechanisms may operate to maintain local adaptation. As niche models assume constant relationships between occurrence and environmental conditions across a species' entire range, an important implication of the temperature-mediated local adaptation detected here is that populations of insects are much more sensitive to future climate changes than current projections suggest.

Date SEP 2015
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:23
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Volume 21

Pages 3313-3322
Publication Global Change Biology
DOI 10.1111/gcb.12920
Issue 9
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

biology, british butterflies, butterfly monitoring scheme, climate change, evolution, fluctuations, habitat availability, life history, local adaptation, models, phenological response, phenology, plasticity, temperature, traits, variability

Attachments

- Full Text

Small mammal species richness is directly linked to regional productivity, but decoupled from food resources, abundance, or habitat complexity

Type Journal Article
Author Christy M. McCain
Author Sarah R. B. King
Author Tim Szewczyk
Author Jan Beck
Abstract Aim Species richness is often strongly correlated with climate. The most commonly invoked mechanism for this climate-richness relationship is the more-individuals-hypothesis (MIH), which predicts a cascading positive influence of climate on plant productivity, food resources, total number of individuals, and species richness. We test for a climate-richness relationship and an underlying MIH mechanism, as well as testing competing hypotheses including positive effects of habitat diversity and heterogeneity, and the species-area effect. Location Methods Colorado Rocky Mountains, USA: two elevational gradients in the Front Range and San Juan Mountains. We conducted standardized small mammal surveys at 32 sites to assess diversity and population sizes. We estimated vegetative and arthropod food resources as well as various aspects of habitat structure by sampling 20 vegetation plots and 40 pitfall traps per site. Temperature, precipitation and net primary productivity (NPP) were assessed along each gradient. Regressions and structural equation modelling were used to test competing diversity hypotheses and mechanistic links predicted by the MIH. Results Main conclusions We detected 3,922 individuals of 37 small mammal species. Mammal species richness peaked at intermediate elevations, as did productivity, whereas temperature decreased and precipitation increased with elevation. We detected strong support for a productivity-richness relationship, but no support for the MIH mechanism. Food and mammal population sizes were unrelated to NPP or mammal species richness. Furthermore, mammal richness was unrelated to habitat diversity, habitat heterogeneity, or elevational area. Sites with high productivity contain high mammal species richness, but a mechanism other than a contemporary MIH underlies the productivity-diversity relationship. Possibly a mechanism based on evolutionary

climatic affiliations. Protection of productive localities and mid-elevations are the most critical for preserving small mammal richness, but may be decoupled from trends in population sizes, food resources, or habitat structure.

Date NOV 2018
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:46
Extra Place: Hoboken Publisher: Wiley WOS:000449496000009
Volume 45
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Publication Journal of Biogeography
DOI 10.1111/jbi.13432
Issue 11
Journal Abbr J. Biogeogr.
ISSN 0305-0270
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

arthropods, elevational gradients, elevational gradients, energy relationships, environmental heterogeneity, food resources, habitat heterogeneity, individuals hypothesis, latitudinal diversity gradient, long-term dynamics, niche conservatism, npp, patterns, plant, plant biomass, scale, species richness

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Snow depth drives habitat selection by overwintering birds in built-up areas, farmlands and forests

Type Journal Article
Author Purabi Deshpande
Author Petteri Lehikoinen
Author Rose Thorogood
Author Aleksi Lehikoinen
Abstract Aim Abundances of animals vary according to species-specific habitat selection, but habitats are undergoing rapid change in response to anthropogenic alterations of land use and climate. The long-term decline of snowfall is one of the most dramatic abiotic changes in boreal regions, with potential to alter species communities and shape future ecosystems. However, the effects of snow cover on habitat-specific abundances remain unclear for many taxa. Here we explore whether long-term declines in snow cover affect the abundances of overwintering birds. Taxon Fifty bird species. Location Finland, Northern Europe. Methods We used generalized linear mixed models to analyse citizen-led monitoring data from 196 transects over a 32-year period to assess whether abundances of birds have changed in built-up areas, farmlands and forests, and whether these covary with warming temperatures and decreasing snow. We then explored if changes in abundance can be explained by body mass, migration strategy or feeding guilds of the species. Results Over the study period, the abundance of overwintering birds increased. This increase was most pronounced in farmlands (69.6%), where abundances were positively

associated with decreasing snow depth. On the other hand, while abundances in built-up habitats (19.5%) decreased over the study period, they increased in periods of high snow depths. Finally, we found that the short-distance migration strategy explains changes in bird abundances with snow. In farmlands, ground feeding birds and heavier birds also show a positive trends in abundance with decreasing snow depths. Main conclusions Local snow conditions are driving habitat selection of birds in the winter; birds in farmlands were most responsive to a decrease in snow depth. Changing snow depths can affect bird movements across habitats in the winter, but also influence migratory patterns and range shifts of species.

Date APR 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:05
Extra Place: Hoboken Publisher: Wiley WOS:000761805200001
Volume 49
Pages 630-639
Publication Journal of Biogeography
DOI 10.1111/jbi.14326
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Journal Abbr J. Biogeogr.
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Date Added 15/03/2023, 14:27:14
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Tags:

biodiversity, citizen science, climate-change, conservation, cover, farmlands, finland, global warming, habitat selection, impacts, landscape, patterns, populations, snow cover, weather, winter ecology

Attachments

- Full Text

Snowpack, fire, and forest disturbance: interactions affect montane invasions by non-native shrubs

Type Journal Article
Author Jens T. Stevens
Author Andrew M. Latimer
Abstract Montane regions worldwide have experienced relatively low plant invasion rates, a trend attributed to increased climatic severity, low rates of disturbance, and reduced propagule pressure relative to lowlands. Manipulative experiments at elevations above the invasive range of non-native species can clarify the relative contributions of these mechanisms to montane invasion resistance, yet such experiments are rare. Furthermore, global climate change and land use changes are expected to cause decreases in snowpack and increases in disturbance by fire and forest thinning in montane forests. We examined the importance of these factors in limiting montane invasions using a field transplant experiment above the invasive range of two non-

native lowland shrubs, Scotch broom (Cytisus scoparius) and Spanish broom (Spartium junceum), in the rain-snow transition zone of the Sierra Nevada of California. We tested the effects of canopy closure, prescribed fire, and winter snow depth on demographic transitions of each species. Establishment of both species was most likely at intermediate levels of canopy disturbance, but at this intermediate canopy level, snow depth had negative effects on winter survival of seedlings. We used matrix population models to show that an 86% reduction in winter snowfall would cause a 2.8-fold increase in population growth rates in Scotch broom and a 3.5-fold increase in Spanish broom. Fall prescribed fire increased germination rates, but decreased overall population growth rates by reducing plant survival. However, at longer fire return intervals, population recovery between fires is likely to keep growth rates high, especially under low snowpack conditions. Many treatment combinations had positive growth rates despite being above the current invasive range, indicating that propagule pressure, disturbance, and climate can all strongly affect plant invasions in montane regions. We conclude that projected reductions in winter snowpack and increases in forest disturbance are likely to increase the risk of invasion from lower elevations.

Date	JUN 2015
Language	English
Short Title	Snowpack, fire, and forest disturbance
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:51:17
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Volume	21
Pages	2379-2393
Publication	Global Change Biology
DOI	10.1111/gcb.12824
Issue	6
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
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Tags:

california, climate change, climate-change, cytisus-scoparius, fire, forest disturbance, impacts, increase, interactions, invasibility, mountains, non-native plants, population-dynamics, seedling establishment, sierra-nevada, snowpack, vegetation

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Spatial and habitat variation in aphid, butterfly, moth and bird phenologies over the last half century

Type	Journal Article
Author	James R. Bell
Author	Marc S. Botham
Author	Peter A. Henrys
Author	David Leech

Author James W. Pearce-Higgins
Author Chris R. Shortall
Author Tom M. Brereton
Author Jon Pickup
Author Stephen J. Thackeray

Abstract Global warming has advanced the timing of biological events, potentially leading to disruption across trophic levels. The potential importance of phenological change as a driver of population trends has been suggested. To fully understand the possible impacts, there is a need to quantify the scale of these changes spatially and according to habitat type. We studied the relationship between phenological trends, space and habitat type between 1965 and 2012 using an extensive UK dataset comprising 269 aphid, bird, butterfly and moth species. We modelled phenologies using generalized additive mixed models that included covariates for geographical (latitude, longitude, altitude), temporal (year, season) and habitat terms (woodland, scrub, grassland). Model selection showed that a baseline model with geographical and temporal components explained the variation in phenologies better than either a model in which space and time interacted or a habitat model without spatial terms. This baseline model showed strongly that phenologies shifted progressively earlier over time, that increasing altitude produced later phenologies and that a strong spatial component determined phenological timings, particularly latitude. The seasonal timing of a phenological event, in terms of whether it fell in the first or second half of the year, did not result in substantially different trends for butterflies. For moths, early season phenologies advanced more rapidly than those recorded later. Whilst temporal trends across all habitats resulted in earlier phenologies over time, agricultural habitats produced significantly later phenologies than most other habitats studied, probably because of nonclimatic drivers. A model with a significant habitat-time interaction was the best-fitting model for birds, moths and butterflies, emphasizing that the rates of phenological advance also differ among habitats for these groups. Our results suggest the presence of strong spatial gradients in mean seasonal timing and nonlinear trends towards earlier seasonal timing that varies in form and rate among habitat types.

Date JUN 2019
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:29
Extra Place: Hoboken Publisher: Wiley WOS:000467441900010
Volume 25
Pages 1982-1994
Publication Global Change Biology
DOI 10.1111/gcb.14592
Issue 6
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

british butterflies, climate change, climate-change, first egg day, first flight, generalized additive mixed models, global warming, lepidoptera, population declines, responses, scale variation, sensitivity, shifts, temperature, temporal trends, trends

Attachments

- Full Text

Spatial genetic structure in an understorey dioecious fig species: the roles of seed rain, seed and pollen-mediated gene flow, and local selection

Type	Journal Article
Author	Hui-Ping Zhou
Author	Jin Chen
Abstract	P>1. The spatial genetic structure (SGS) of a plant population is mainly determined by gene flow via seed and pollen, various natural selection pressures and spatial patterns of existing plants. However, the role of those factors in shaping SGS requires further investigation. 2. We studied the relative importance of those factors in shaping the SGS of an understorey dioecious fig species (Ficus cyrtophylla). Spatial patterns of existing individuals and microhabitat were surveyed, patterns of seed rain were investigated, seed dispersers were observed in the field, and the gene flow and SGS of a focal population were determined. 3. Three mid-sized bulbul (Pycnonotus spp.) species were the primary dispersers of Ficus cyrtophylla fruits. All the age cohorts exhibited clumped patterns with a decreasing trend from seeds to seedlings, saplings and adults. Seed rain occurred in a non-random pattern with high clumping in moderately lit microhabitats. The observed pattern suggests disperser preferences for those microhabitats resulting in higher seed deposition. 4. Seeds and pollen of F. cyrtophylla were widely dispersed (ranging from 9 m to 2.75 km and 10 m to 3 km, respectively). About two-thirds of seeds and half of the pollen grains were locally dispersed (< 250 m) within the focal population. 5. Significant positive autocorrelations occurred at a local scale (< 10 m) in seeds and seedlings but not in saplings and adults. The SGS pattern disappeared when we reduced the sample size of seedlings to that for the saplings, which suggests that demographic thinning effects (e.g. density-dependent predation and competition) on spatial distribution may lead to the loss of SGS through transitions from seedlings to saplings and adults. 6. Synthesis. Although F. cyrtophylla seeds and pollen were widely dispersed, the significant SGS present in seedlings probably resulted from clumped seed dispersal due to dispersers' behaviour and high seedfall beneath parent trees. The loss of SGS in sapling and adult life stages is probably caused by demographic selection effects during recruitment. Our study emphasizes the different roles of dispersal and local selection in shaping SGS of plant populations.
Date	SEP 2010
Language	English
Short Title	Spatial genetic structure in an understorey dioecious fig species
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:35
Extra	Place: Hoboken Publisher: Wiley WOS:000280667200020

Volume 98
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Publication Journal of Ecology
DOI 10.1111/j.1365-2745.2010.01683.x
Issue 5
Journal Abbr J. Ecol.
ISSN 0022-0477
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Tags:

consequences, dioecious, dispersal, ficus, Ficus cyrtophylla, gene flow, habitat, history, hong-kong, local selection, microsatellite markers, neotropical tree, patterns, pollen dispersal, seed dispersal, seed rain, spatial genetic structure, xishuangbanna

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Spatially explicit risk mapping reveals direct anthropogenic impacts on migratory birds

Type Journal Article
Author Claire Buchan
Author Aldina M. A. Franco
Author Ines Catry
Author Anna Gamero
Author James J. Gilroy
Author Richard Field
Abstract Aim Migratory species rely on multiple ranges across the annual cycle, rendering them vulnerable to a wide range of spatially disparate anthropogenic threats. The spatial distribution of these threats will strongly influence the magnitude of their population-scale effects, but this has not been quantitatively assessed for most species. Location Europe, Central Asia, Western Asia, Africa. Time period Modern. Major taxa studied Aves. Methods We combined remote-sensed data and expert opinion to map 16 anthropogenic threats relevant to migratory birds across Europe, Africa and the Middle East - including the first spatially-explicit pan-continental assessment of relative hunting pressure. By combining the resulting composite threat maps with species range polygons and morpho-behavioural traits-based weightings (reflecting relative threat susceptibility), we created species-specific risk maps for 103 Afro-Palaearctic migratory birds breeding in Europe and evaluated how spatial threat vulnerability relates to long-term population trends. Results We found that greater vulnerability to direct mortality threats (including hunting pressure, infrastructure and nocturnal lights), especially in the non-breeding season, is associated with declining bird population trends. Main conclusions Our results emphasize the importance of spatially explicit approaches to quantifying anthropogenic drivers of population declines. Composite risk maps represent a valuable resource for spatial analyses of anthropogenic threats to migratory birds, allowing for targeted conservation actions.
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Language English
Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
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Volume 31
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Publication Global Ecology and Biogeography
DOI 10.1111/geb.13551
Issue 9
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ISSN 1466-822X
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Tags:

Afro-Palaearctic, anthropogenic change, breeding, climate-change, conservation, extinction, hunting, land-use change, migrant birds, migratory birds, mortality, non-breeding, patterns, population declines, species richness, threat mapping, threats

Attachments

- Accepted Version

Spatiotemporal modelling of abundance from multiple data sources in an integrated spatial distribution model

Type Journal Article
Author Nicolas Strebel
Author Marc Kery
Author Jerome Guelat
Author Thomas Sattler
Abstract Aim In biodiversity monitoring, observational data are often collected in multiple, disparate schemes with greatly varying degrees of standardization and possibly at different spatial and temporal scales. Technical advances also change the type of data over time. The resulting heterogeneous datasets are often deemed to be incompatible. Consequently, many available datasets may be ignored in practical analyses. Here, we propose a more efficient use of disparate biodiversity data to assess species distributions and population trends. Location Switzerland (Europe). Taxon Birds. Methods We developed an integrated, hierarchical species distribution model with a joint likelihood for all datasets using a shared state process (e.g. latent species abundance or occurrence), but distinct observation process for each dataset. We show how the abundance submodel of a binomial N-mixture model can fuse four different data types (count, detection/non-detection, presence-only and absence-only data) and enable improved inferences about spatiotemporal patterns in abundance. As case studies, we use data from multiple avian biodiversity monitoring schemes. In the first, the goal is estimating abundance-based species distribution maps. In the second, we infer trends in population abundance across time. Results Accuracy and precision of abundance estimates increased when combining data from different sources compared to using a single data source alone. This is

particularly valuable when data from each single data source are too sparse for reliable parameter estimation. Main conclusions We show that exploiting the complementary nature of 'cheap', but abundant, citizen-science data and less abundant, but more information-rich, data from structured monitoring programmes might be ideal to estimate distribution and population trends more accurately, especially for rare species. Joint likelihoods allow to include a wide variety of different datasets to (1) combine all the available information and to (2) mitigate weaknesses of one by the strength of another.

Date MAR 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
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Extra Place: Hoboken Publisher: Wiley WOS:000760939700001
Volume 49
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Journal Abbr J. Biogeogr.
ISSN 0305-0270
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Tags:

bias, binomial N-mixture model, birds, census, counts, distribution map, imperfect detection, integrated species distribution model, joint likelihood, local abundance, population trend, population trends, rates, recovery, sdm, site-occupancy model, species distribution

Attachments

- Full Text

Species life-history strategies affect population responses to temperature and land-cover changes

Type Journal Article
Author Gonzalo Albaladejo-Robles
Author Monika Bohm
Author Tim Newbold
Abstract Human-induced environmental changes have a direct impact on species populations, with some species experiencing declines while others display population growth. Understanding why and how species populations respond differently to environmental changes is fundamental to mitigate and predict future biodiversity changes. Theoretically, species life-history strategies are key determinants shaping the response of populations to environmental impacts. Despite this, the association between species life histories and the response of populations to environmental

changes has not been tested. In this study, we analysed the effects of recent land-cover and temperature changes on rates of population change of 1,072 populations recorded in the Living Planet Database. We selected populations with at least 5 yearly consecutive records (after imputation of missing population estimates) between 1992 and 2016, and for which we achieved high population imputation accuracy (in the cases where missing values had to be imputed). These populations were distributed across 553 different locations and included 461 terrestrial amniote vertebrate species (273 birds, 137 mammals, and 51 reptiles) with different life-history strategies. We showed that populations of fast-lived species inhabiting areas that have experienced recent expansion of cropland or bare soil present positive populations trends on average, whereas slow-lived species display negative population trends. Although these findings support previous hypotheses that fast-lived species are better adapted to recover their populations after an environmental perturbation, the sensitivity analysis revealed that model outcomes are strongly influenced by the addition or exclusion of populations with extreme rates of change. Therefore, the results should be interpreted with caution. With climate and land-use changes likely to increase in the future, establishing clear links between species characteristics and responses to these threats is fundamental for designing and conducting conservation actions. The results of this study can aid in evaluating population sensitivity, assessing the likely conservation status of species with poor data coverage, and predicting future scenarios of biodiversity change.

Date	JAN 2023
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed	15/03/2023, 14:47:02
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Volume	29
Pages	97-109
Publication	Global Change Biology
DOI	10.1111/gcb.16454
Issue	1
Journal Abbr	Glob. Change Biol.
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Tags:

biodiversity, climate, climate-change, diversity, homogenization, imputation, land-use change, life-histories, living planet index, macroecology, metaanalysis, population trends, terrestrial, terrestrial vertebrates, time-series, traits

Attachments

- Full Text

SRUD: A simple non-destructive method for accurate quantification of plant diversity dynamics

Type	Journal Article
Author	Pengfei Zhang
Author	George A. Kowalchuk
Author	Merel B. Soons
Author	Mariet M. Hefting
Author	Chengjin Chu
Author	Jennifer Firn
Author	Cynthia S. Brown
Author	Xianhui Zhou
Author	Xiaolong Zhou
Author	Zhi Guo
Author	Zhigang Zhao
Author	Guozhen Du
Author	Yann Hautier
Abstract	1. Predicting changes in plant diversity in response to human activities represents one of the major challenges facing ecologists and land managers striving for sustainable ecosystem management. Classical field studies have emphasized the importance of community primary productivity in regulating changes in plant species richness. However, experimental studies have yielded inconsistent empirical evidence, suggesting that primary productivity is not the sole determinant of plant diversity. Recent work has shown that more accurate predictions of changes in species diversity can be achieved by combining measures of species' cover and height into an index of space resource utilization (SRU). While the SRU approach provides reliable predictions, it is time-consuming and requires extensive taxonomic expertise. Ecosystem processes and plant community structure are likely driven primarily by dominant species (mass ratio effect). Within communities, it is likely that dominant and rare species have opposite contributions to overall biodiversity trends. We, therefore, suggest that better species richness predictions can be achieved by utilizing SRU assessments of only the dominant species (SRUD), as compared to SRU or biomass of the entire community. 2. Here, we assess the ability of these measures to predict changes in plant diversity as driven by nutrient addition and herbivore exclusion. First, we tested our hypotheses by carrying out a detailed analysis in an alpine grassland that measured all species within the community. Next, we assessed the broader applicability of our approach by measuring the first three dominant species for five additional experimental grassland sites across a wide geographic and habitat range. 3. We show that SRUD outperforms community biomass, as well as community SRU, in predicting biodiversity dynamics in response to nutrients and herbivores in an alpine grassland. Across our additional sites, SRUD yielded far better predictions of changes in species richness than community biomass, demonstrating the robustness and generalizable nature of this approach. 4. Synthesis. The SRUD approach provides a simple, non-destructive and more accurate means to monitor and predict the impact of global change drivers and management interventions on plant communities, thereby facilitating efforts to maintain and recover plant diversity.
Date	SEP 2019
Language	English
Short Title	SRUD
Library Catalogue	Web of Science Nextgen

URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:32
Extra	Place: Hoboken Publisher: Wiley WOS:000484311000011
Volume	107
Pages	2155-2166
Publication	Journal of Ecology
DOI	10.1111/1365-2745.13205
Issue	5
Journal Abbr	J. Ecol.
ISSN	0022-0477
Date Added	15/03/2023, 14:29:40
Modified	15/03/2023, 14:29:40

Tags:

abundance, biodiversity loss, biomass, dominant species, ecosystem stability, herbivory, impact, light, maximum plant height, nitrogen deposition, nutrient enrichment, percent cover, plant population and community dynamics, productivity, resource control, rhinanthus, space resource utilization, species richness

Attachments

- Full Text

Survival in macaroni penguins and the relative importance of different drivers: individual traits, predation pressure and environmental variability

Type	Journal Article
Author	Catharine Horswill
Author	Jason Matthiopoulos
Author	Jonathan A. Green
Author	Michael P. Meredith
Author	Jaume Forcada
Author	Helen Peat
Author	Mark Preston
Author	Phil N. Trathan
Author	Norman Ratcliffe

Abstract 1. Understanding the demographic response of free-living animal populations to different drivers is the first step towards reliable prediction of population trends. 2. Penguins have exhibited dramatic declines in population size, and many studies have linked this to bottom-up processes altering the abundance of prey species. The effects of individual traits have been considered to a lesser extent, and top-down regulation through predation has been largely overlooked due to the difficulties in empirically measuring this at sea where it usually occurs. 3. For 10 years (2003-2012), macaroni penguins (Eudyptes chrysolophus) were marked with subcutaneous electronic transponder tags and re-encountered using an automated gateway system fitted at the entrance to the colony. We used multistate mark-recapture modelling to identify the different drivers influencing survival rates and a sensitivity analysis to assess their relative importance across different life stages. 4. Survival rates were low and variable during the fledging year (mean = 0.33), increasing to much higher levels from age 1 onwards (mean = 0.89). We show that survival of macaroni penguins is driven by a combination of individual quality, top-down predation pressure and bottom-up environmental forces. The relative importance of these covariates was age specific. During the fledging year, survival rates were most sensitive to top-down predation pressure, followed by individual fledging mass, and finally bottom-up environmental effects. In contrast, birds older than 1 year showed a similar response to bottom-up environmental effects and top-down predation pressure. 5. We infer from our results that macaroni penguins will most likely be negatively impacted by an increase in the local population size of giant petrels. Furthermore, this population is, at least in the short term, likely to be positively influenced by local warming. More broadly, our results highlight the importance of considering multiple causal effects across different life stages when examining the survival rates of seabirds.

Date	SEP 2014
Language	English
Short Title	Survival in macaroni penguins and the relative importance of different drivers
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:25
Extra	Place: Hoboken Publisher: Wiley WOS:000340877700007
Volume	83
Pages	1057-1067
Publication	Journal of Animal Ecology
DOI	10.1111/1365-2656.12229
Issue	5
Journal Abbr	J. Anim. Ecol.
ISSN	0021-8790
Date Added	15/03/2023, 14:29:40
Modified	15/03/2023, 14:29:40

Tags:

antarctic krill, bird island, bottom-up, climate-change, demography, El Nino/Southern Oscillation, eudyptes-chrysolophus, fledging mass, giant petrel, giant petrels macronectes, intrinsic factors, krill euphausia-superba, megadyptes-antipodes, population-dynamics, postfledging survival, predation, sea surface temperature, south georgia, southern annular mode, top-down

Attachments

- Full Text

Swedish birds are tracking temperature but not rainfall: evidence from a decade of abundance changes

Type	Journal Article

Author Catherine Tayleur
Author Paul Caplat
Author Dario Massimino
Author Alison Johnston
Author Niclas Jonzen
Author Henrik G. Smith
Author Ake Lindstroem

Abstract AimTo quantify avian distribution shifts and the extent of niche tracking in response to changing temperature and precipitation patterns. LocationSweden. MethodsWe used abundance monitoring data to quantify changes in bird species distributions between two time periods, 2000-02 and 2010-12. First we examined shifts at the level of whole distributions using population centroids in temperature, rainfall, altitude, latitude and longitude. We then characterized shifts in temperature and latitude at different parts of species ranges using species response curves (SRC). We accounted for yearly turnover in abundance and sampling effort, and compared the observed shifts with those expected under perfect niche tracking. ResultsMost species demonstrated changes in their distributions over the last decade but not all were in response to weather. The degree to which species tracked their climatic niches and the dynamics driving these shifts varied considerably. Only 20% of species shifted in the direction expected given the temperature changes, while few showed a strong response to rainfall. Most shifts did not fully compensate for changes in temperature. Range changes were most evident at the leading edges, but there was some evidence for retractions of trailing edges. Amongst species that tracked temperature, those with southerly distributions were less successful at tracking changes than those in the north. Main conclusionsSwedish birds demonstrated highly dynamic distributions, with many rapid directional shifts occurring over the last decade. However, only a few species kept pace with observed climatic change. Species that did not track their climatic niche may be tolerant to ongoing climatic change or constrained by strong habitat requirements. We demonstrate that measuring range shifts along both environmental and geographic gradients can help disentangle drivers of distribution changes.

Date JUL 2015
Language English
Short Title Swedish birds are tracking temperature but not rainfall
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:51:14
Extra Place: Hoboken Publisher: Wiley WOS:000355834900012
Volume 24
Pages 859-872
Publication Global Ecology and Biogeography
DOI 10.1111/geb.12308
Issue 7
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
Date Added 15/03/2023, 14:51:19
Modified 15/03/2023, 14:51:19

Tags:

biotic interactions, Climate change, climate tracking, climate-change, fauna, limits, niche, niche modelling, poleward shifts, population trends, range margins, range shifts, species distributions, turnover

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Synergistic effects of harvest and climate drive synchronous somatic growth within key New Zealand fisheries

Type Journal Article

Author John R. Morrongiello
Author Peter L. Horn
Author Caoimhghin O. Maolagain
Author Philip J. H. Sutton

Abstract Fisheries harvest has pervasive impacts on wild fish populations, including the truncation of size and age structures, altered population dynamics and density, and modified habitat and assemblage composition. Understanding the degree to which harvest-induced impacts increase the sensitivity of individuals, populations and ultimately species to environmental change is essential to ensuring sustainable fisheries management in a rapidly changing world. Here we generated multiple long-term (44-62 years), annually resolved, somatic growth chronologies of four commercially important fishes from New Zealand's coastal and shelf waters. We used these novel data to investigate how regional- and basin-scale environmental variability, in concert with fishing activity, affected individual somatic growth rates and the magnitude of spatial synchrony among stocks. Changes in somatic growth can affect individual fitness and a range of population and fishery metrics such as recruitment success, maturation schedules and stock biomass. Across all species, individual growth benefited from a fishing-induced release of density controls. For nearshore snapper and tarakihi, regional-scale wind and temperature also additively affected growth, indicating that future climate change-induced warming and potentially strengthened winds will initially promote the productivity of more poleward populations. Fishing increased the sensitivity of deep-water hoki and ling growth to the Interdecadal Pacific Oscillation (IPO). A forecast shift to a positive IPO phase, in concert with current harvest strategies, will likely promote individual hoki and ling growth. At the species level, historical fishing practices and IPO synergized to strengthen spatial synchrony in average growth between stocks separated by 400-600 nm of ocean. Increased spatial synchrony can, however, increase the vulnerability of stocks to deleterious stochastic events. Together, our individual- and species-level results show how fishing and environmental factors can conflate to initially promote individual growth but then possibly heighten the sensitivity of stocks to environmental change.

Date APR 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:50:40
Extra Place: Hoboken Publisher: Wiley WOS:000612141700001
Volume 27
Pages 1470-1484
Publication Global Change Biology
DOI 10.1111/gcb.15490

Issue 7
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:51:19
Modified 15/03/2023, 14:51:19

Tags:

age, climate change, density-dependent growth, dispersal, fish populations, fishing, fluctuations, Moran Effect, otolith biochronology, pacific, Pacific Ocean, population dynamics, reef fish, sea-surface temperature, size, southern-hemisphere, spatial synchrony, spatial synchrony, trends

Attachments

- Full Text

Temperature and precipitation at migratory grounds influence demographic trends of an Arctic-breeding bird

Type Journal Article
Author Susan Doyle
Author David Cabot
Author Alyn Walsh
Author Richard Inger
Author Stuart Bearhop
Author Barry J. McMahon
Abstract Anthropogenic climate disruption, including temperature and precipitation regime shifts, has been linked to animal population declines since the mid-20th century. However, some species, such as Arctic-breeding geese, have thrived during this period. An increased understanding of how climate disruption might link to demographic rates in thriving species is an important perspective in quantifying the impact of anthropogenic climate disruption on the global state of nature. The Greenland barnacle goose (Branta leucopsis) population has increased tenfold in abundance since the mid-20th century. A concurrent weather regime shift towards warmer, wetter conditions occurred throughout its range in Greenland (breeding), Ireland and Scotland (wintering) and Iceland (spring and autumn staging). The aim of this study was to determine the relationship between weather and demographic rates of Greenland barnacle geese to discern the role of climate shifts in the population trend. We quantified the relationship between temperature and precipitation and Greenland barnacle goose survival and productivity over a 50 year period from 1968 to 2018. We detected significant positive relationships between warmer, wetter conditions on the Icelandic spring staging grounds and survival. We also detected contrasting relationships between warmer, wetter conditions during autumn staging and survival and productivity, with warm, dry conditions being the most favourable for productivity. Survival increased in the latter part of the study period, supporting the possibility that spring weather regime shifts contributed to the increasing population trend. This may be related to improved forage resources, as warming air temperatures have been shown to improve survival rates in several other Arctic and northern terrestrial herbivorous species through indirect bottom-up effects on forage availability.
Date OCT 2020

Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:50:55
Extra	Place: Hoboken Publisher: Wiley WOS:000553042200001
Volume	26
Pages	5447-5458
Publication	Global Change Biology
DOI	10.1111/gcb.15267
Issue	10
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:51:19
Modified	15/03/2023, 14:51:19

Tags:

abundance, barnacle geese, barnacle goose, beta regression, Branta leucopsis, branta-leucopsis, climate disruption, climate-change, Cormack-Jolly-Seber (CJS) model, density, mismatch, population-dynamics, productivity, survival, vegetation

Attachments

- Accepted Version

Temperature effects on fish production across a natural thermal gradient

Type	Journal Article
Author	Eoin J. O'Gorman
Author	Olafur P. Olafsson
Author	Benoit O. L. Demars
Author	Nikolai Friberg
Author	Gudni Gudbergsson
Author	Elisabet R. Hannesdottir
Author	Michelle C. Jackson
Author	Liselotte S. Johansson
Author	Orla B. McLaughlin
Author	Jon S. Olafsson
Author	Guy Woodward
Author	Gisli M. Gislason
Abstract	Global warming is widely predicted to reduce the biomass production of top predators, or even result in species loss. Several exceptions to this expectation have been identified, however, and it is vital that we understand the underlying mechanisms if we are to improve our ability to predict future trends. Here, we used a natural warming experiment in Iceland and quantitative theoretical predictions to investigate the success of brown trout as top predators across a stream temperature gradient (4-25 degrees C). Brown trout are at the northern limit of their geographic

distribution in this system, with ambient stream temperatures below their optimum for maximal growth, and above it in the warmest streams. A five-month mark-recapture study revealed that population abundance, biomass, growth rate, and production of trout all increased with stream temperature. We identified two mechanisms that contributed to these responses: (1) trout became more selective in their diet as stream temperature increased, feeding higher in the food web and increasing in trophic position; and (2) trophic transfer through the food web was more efficient in the warmer streams. We found little evidence to support a third potential mechanism: that external subsidies would play a more important role in the diet of trout with increasing stream temperature. Resource availability was also amplified through the trophic levels with warming, as predicted by metabolic theory in nutrient-replete systems. These results highlight circumstances in which top predators can thrive in warmer environments and contribute to our knowledge of warming impacts on natural communities and ecosystem functioning.

Date SEP 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:49
Extra Place: Hoboken Publisher: Wiley WOS:000381077300021
Volume 22
Pages 3206-3220
Publication Global Change Biology
DOI 10.1111/gcb.13233
Issue 9
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:52:53
Modified 15/03/2023, 14:52:53

Tags:

Arctic, body-size, brown trout, climate-change, ecosystem services, food-web structure, freshwater, geothermally heated stream, Hengill, mark-recapture, natural experiment, oncorhynchus-mykiss, PIT tag, potential impacts, Salmo trutta fario, salvelinus-alpinus, sentinel systems, trout salmo-trutta

Attachments

- Full Text

Temperature-associated decreases in demographic rates of Afrotropical bird species over 30 years

Type Journal Article
Author Montague H. C. Neate-Clegg
Author Thomas R. Stanley
Author Cagan H. Sekercioglu
Author William D. Newmark

Abstract Tropical mountains harbor globally significant levels of biodiversity and endemism. Climate change threatens many tropical montane species, yet little research has assessed the effects of climate change on the demographic rates of tropical species, particularly in the Afrotropics. Here, we report on the demographic rates of 21 Afrotropical bird species over 30 years in montane forests in Tanzania. We used mark-recapture analyses to model rates of population growth, recruitment, and apparent survival as functions of annual mean temperature and annual precipitation. For over one-half of focal species, decreasing population growth rates were associated with increasing temperature. Due to the trend in temperature over time, we substituted a time covariate for the temperature covariate in top-ranked population growth rate models. Temperature was a better explanatory covariate than time for 6 of the 12 species, or 29% of all focal species. Population growth rates were also lower for species found further below their elevational midpoint and for smaller-bodied species. Changes in population growth rates were more closely tied to changes in recruitment than to changes in apparent survival. There were no consistent associations between demographic rates and precipitation. This study demonstrates temperature-associated demographic impacts for 6 (29%) of 21 focal species in an Afrotropical understory bird community and highlights the need to incorporate the impacts of climate change on demographic rates into conservation planning across the tropics.

Date MAY 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:27
Extra Place: Hoboken Publisher: Wiley WOS:000626552200001
Volume 27
Pages 2254-2268
Publication Global Change Biology
DOI 10.1111/gcb.15567
Issue 10
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Tags:

body mass, climate change, climate-change, Eastern Arc Mountains, elevational range, evolutionary responses, habitat fragmentation, interspecific aggression, nest predation, population growth rate, population-growth, precipitation, recapture, recruitment, seasonal-variation, survival, temperature, tropical bird, tropical mountains

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Temporal shift in density dependence among North American breeding duck populations

Type Journal Article
Author Dennis L. Murray

Author Michael G. Anderson
Author Todd D. Steury

Abstract Environmental perturbation can have a marked influence on abundance and trend in many animal populations, but information is scant on how numerical change relates to variability in density-dependent and density-independent processes acting on populations. Using breeding population estimates for 10 duck species from a Survey area of similar to 2.2 million km(2) in central North America (1955-2005), we compared population growth models and related parameters among species and across time. All duck species showed evidence of density-dependent growth, and the best-fit relationship between population growth (r(t)) and population size (N-t) was linear or convex for all species. Density dependence and associated population parameters were not related to an index of species life history strategy. Reanalysis of segmented (1955-1979, 1980-2005) r(t) time series, where the truncation date coincided with a putative decline in wetland availability oil breeding grounds, showed that density-dependent forces were weakened during the latter time. segment. Additionally, in later years most Populations experienced increased first-order autocorrelation in annual Counts, decreased intrinsic growth rate, increased nonlinearity in the relationship between r(t) and N-t, increased equilibrium return time, and increased inter-species synchrony in numbers. Such changes were not closely related to species life history strategy or to shifts in mean population size, average trend, and estimated carrying capacity. We speculate that shifts in breeding duck habitat quality altered historical predator-prey dynamics in the system and thereby underlie observed dynamical changes. The paradoxical finding that population abundance and trend do not reveal shifts in population processes highlights the need to go beyond simple numerical assessment when evaluating Population responses to environmental perturbation.

Date FEB 2010
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:50
Extra Place: Hoboken Publisher: Wiley WOS:000275816900028
Volume 91
Pages 571-581
Publication Ecology
DOI 10.1890/MS08-1032.1
Issue 2
Journal Abbr Ecology
ISSN 0012-9658
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

abundance, density dependence, ducks, fish, growth rate, patterns, population regulation, temporal shifts, time series analysis, time-series, waterfowl, wetlands

Testing predictions of the Janzen-Connell hypothesis: a meta-analysis of experimental evidence for distance- and density-dependent seed and seedling survival

Type Journal Article
Author Liza S. Comita
Author Simon A. Queenborough
Author Stephen J. Murphy
Author Jenalle L. Eck
Author Kaiyang Xu
Author Meghna Krishnadas
Author Noelle Beckman
Author Yan Zhu

Abstract 1. The Janzen-Connell hypothesis proposes that specialist natural enemies, such as herbivores and pathogens, maintain diversity in plant communities by reducing survival rates of conspecific seeds and seedlings located close to reproductive adults or in areas of high conspecific density. Variation in the strength of distance- and density-dependent effects is hypothesized to explain variation in plant species richness along climatic gradients, with effects predicted to be stronger in the tropics than the temperate zone and in wetter habitats compared to drier habitats. 2. We conducted a comprehensive literature search to identify peer-reviewed experimental studies published in the 40+ years since the hypothesis was first proposed. Using data from these studies, we conducted a meta-analysis to assess the current weight of evidence for the distance and density predictions of the Janzen-Connell hypothesis. 3. Overall, we found significant support for both the distance- and density-dependent predictions. For all studies combined, survival rates were significantly reduced near conspecifics compared to far from conspecifics, and in areas with high densities of conspecifics compared to areas with low conspecific densities. There was no indication that these results were due to publication bias. 4. The strength of distance and density effects varied widely among studies. Contrary to expectations, this variation was unrelated to latitude, and there was no significant effect of study region. However, we did find a trend for stronger distance and density dependence in wetter sites compared to sites with lower annual precipitation. In addition, effects were significantly stronger at the seedling stage compared to the seed stage. 5. Synthesis. Our study provides support for the idea that distance- and density-dependent mortality occurs in plant communities world-wide. Available evidence suggests that natural enemies are frequently the cause of such patterns, consistent with the Janzen-Connell hypothesis, but additional studies are needed to rule out other mechanisms (e.g. intraspecific competition). With the widespread existence of density and distance dependence clearly established, future research should focus on assessing the degree to which these effects permit species coexistence and contribute to the maintenance of diversity in plant communities.

Date JUL 2014
Language English
Short Title Testing predictions of the Janzen-Connell hypothesis
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed 15/03/2023, 14:29:16
Extra Place: Hoboken Publisher: Wiley WOS:000338027500003
Volume 102

Pages 845-856
Publication Journal of Ecology
DOI 10.1111/1365-2745.12232
Issue 4
Journal Abbr J. Ecol.
ISSN 0022-0477
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Tags:

coexistence, consequences, determinants of plant community diversity and structure, diversity, herbivory, maintenance of diversity, mechanisms, mortality, natural enemies, pathogens, plant population and community dynamics, plant-soil feedbacks, review, seed predation, spatial-patterns, species coexistence, tree, tropical forest, tropical forests

Attachments

- Full Text

The biogeography of diet diversity of barn owls on Mediterranean islands

Type Journal Article
Author Franc Janzekovic
Author Tina Klenovsek
Abstract Aim Following the classical MacArthur-Wilson island equilibrium model of species richness, we hypothesize that island size and isolation affect prey composition and diet diversity of predators on islands. We used the barn owl as a model predatory organism that is known for feeding and habitat flexibility and explored the patterns of its diet on Mediterranean islands in relation to the island biogeography and human population density. Location Mediterranean Islands. Taxon Barn owl (Tyto alba) and its prey. Methods Data on taxonomic composition of the barn owl diet were obtained from pellets (Adriatic island of Korcula) and from published studies performed on 18 Mediterranean islands. For each island, diet diversity indices were calculated and correlated with island area, linear distance from the mainland, human population size and density, and geospatial trends. Results Murinae mice and rats were the dominant prey. The proportion of birds and reptiles consumed was 5 and 18 times higher, respectively, than in Europe in general. Diet diversity correlated with island size, but not island isolation. Island size was also a good predicator of the proportions of the vertebrate prey. Human population density and longitude had no effect on diet diversity. Main conclusions Diet diversity of the barn owl on Mediterranean islands only partly followed the island biogeography theory. Diet diversity was greater on the larger Mediterranean islands. However, a more diverse diet did not mean a higher number of taxa, but a wider range of abundant and evenly represented taxa. The smaller the islands, the more birds and reptiles were consumed, compared to higher proportions of mammals on the larger islands. These findings support the idea of barn owls' feeding flexibility and opportunistic predator behaviour. Despite the barn owl being a synanthropic bird, urbanization had no influence on its diet diversity. Also island isolation had no significant effect.
Date NOV 2020
Language English

Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:26:43
Extra Place: Hoboken Publisher: Wiley WOS:000567437400001
Volume 47
Pages 2353-2361
Publication Journal of Biogeography
DOI 10.1111/jbi.13955
Issue 11
Journal Abbr J. Biogeogr.
ISSN 0305-0270
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

birds, consumption, diet, island biogeography, MacArthur-Wilson equilibrium theory, mammals, patterns, pellets, prey, Tyto alba, tyto-alba

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The decline of butterflies in Europe: Problems, significance, and possible solutions

Type Journal Article
Author Martin S. Warren
Author Dirk Maes
Author Chris A. M. van Swaay
Author Philippe Goffart
Author Hans Van Dyck
Author Nigel A. D. Bourn
Author Irma Wynhoff
Author Dan Hoare
Author Sam Ellis
Abstract We review changes in the status of butterflies in Europe, focusing on long-running population data available for the United Kingdom, the Netherlands, and Belgium, based on standardized monitoring transects. In the United Kingdom, 8% of resident species have become extinct, and since 1976 overall numbers declined by around 50%. In the Netherlands, 20% of species have become extinct, and since 1990 overall numbers in the country declined by 50%. Distribution trends showed that butterfly distributions began decreasing long ago, and between 1890 and 1940, distributions declined by 80%. In Flanders (Belgium), 20 butterflies have become extinct (29%), and between 1992 and 2007 overall numbers declined by around 30%. A European Grassland Butterfly Indicator from 16 European countries shows there has been a 39% decline of grassland butterflies since 1990. The 2010 Red List of European butterflies listed 38 of the 482 European species (8%) as threatened and 44 species (10%) as near threatened (note that 47 species were not assessed). A country level analysis indicates that the average Red List rating is highest in central and mid-Western Europe and lowest in the far north of Europe and around the Mediterranean. The causes of the decline of butterflies are thought to be similar in

most countries, mainly habitat loss and degradation and chemical pollution. Climate change is allowing many species to spread northward while bringing new threats to susceptible species. We describe examples of possible conservation solutions and a summary of policy changes needed to conserve butterflies and other insects.

Date	JAN 12 2021
Language	English
Short Title	The decline of butterflies in Europe
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:29
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000607277100010
Volume	118
Pages	e2002551117
Publication	Proceedings of the National Academy of Sciences of the United States of America
DOI	10.1073/pnas.2002551117
Issue	2
Journal Abbr	Proc. Natl. Acad. Sci. U. S. A.
ISSN	0027-8424
Date Added	15/03/2023, 14:29:40
Modified	15/03/2023, 14:29:40

Tags:

abundance, butterflies, climate-change, conservation, data reveal, Europe, extinction, grasslands, habitat, insect decline, landscape, monitoring, nitrogen, red list

Attachments

- Full Text

The dynamics of vegetation grazed by a food-limited population of Soay sheep on St Kilda

Type	Journal Article
Author	Michael J. Crawley
Author	Robin J. Pakeman
Author	Steve D. Albon
Author	Jill G. Pilkington
Author	Ian R. Stevenson
Author	Michael B. Morrissey
Author	Owen R. Jones
Author	Eric Allan
Author	Ana Bento
Author	Helen Hipperson
Author	Gebre Asefa
Author	Josephine M. Pemberton

Abstract The population of Soay sheep on the island of Hirta in the Outer Hebrides has been the subject of continuous study for more than 35 years. This paper focuses on the botanical aspects of the plant-herbivore interaction, showing how the vegetation affects and is affected by the sheep. Grazing impacts on biomass and spatial structure varied across plant communities, with Holcus/Agrostis grasslands affected most and Wet Heath least, consistent with the hypothesis that herbivore impacts are proportional to plant productivity. Within plant communities, the negative relationships between sheep numbers and plant abundance (sward height, gap/tussock cover and biomass) were significant in March but not significant in August, as expected if sheep numbers are limited by food supply in winter. In most species, flower stem density declined with increasing sheep numbers. There were no examples where unpalatable plants showed increased flowering (e.g. from competitor release under selective grazing). Plant production in temporary grazing exclosures (above-ground net primary production) was greatest in Holcus/Agrostis grassland (12.6 t ha(-1) dry matter year(-1)), lower in Nardus grassland (5.1 t ha(-1) year(-1)) and least in Plantago sward (1.3 t ha(-1) year(-1)) associated with differences in historical nutrient supply and microclimate. The net effect of grazing on plant species richness was positive: A few highly palatable species were excluded, but small-scale coexistence of grazing-tolerant species was enhanced by defoliation. The Soay sheep population fluctuated from 908 (in 1988) to 2,208 (in 2009), increasing by an average of 39 extra animals per year over the period 1985-2011. Between 2011 and 2020, the population fluctuated less widely and showed no trend. Population change (ln(N(t + 1)/N(t))) was inversely density dependent but positively correlated with plant production in Holcus/Agrostis grassland which increased during the study. This plant-herbivore interaction is highly resilient, and though some species (Festuca rubra and Ranunculus acris) declined in the Holcus/Agrostis grassland, there was no significant upward trend in the abundance of unpalatable plant species. Synthesis. Implications for future studies and analyses of plant-herbivore data. Concentrating on estimating primary productivity and herbivore offtake, rather than simply measuring change in plant biomass, is likely to provide greatly improved explanatory power for understanding herbivore population dynamics.

Date DEC 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:08
Extra Place: Hoboken Publisher: Wiley WOS:000713562200001
Volume 109
Pages 3988-4006
Publication Journal of Ecology
DOI 10.1111/1365-2745.13782
Issue 12
Journal Abbr J. Ecol.
ISSN 0022-0477
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

density, dependence, ecosystem, flowering, grassland plant diversity, grazing, herbivores, management, palatability, plant-herbivore dynamics, primary productivity, productivity, Soay sheep, soils, St Kilda, stress

Attachments

- Full Text

The effect of warmer winters on the demography of an outbreak insect is hidden by intraspecific competition

Type	Journal Article
Author	Devin W. Goodsman
Author	Guenchik Grosklos
Author	Brian H. Aukema
Author	Caroline Whitehouse
Author	Katherine P. Bleiker
Author	Nate G. McDowell
Author	Richard S. Middleton
Author	Chonggang Xu
Abstract	Warmer climates are predicted to increase bark beetle outbreak frequency, severity, and range. Even in favorable climates, however, outbreaks can decelerate due to resource limitation, which necessitates the inclusion of competition for limited resources in analyses of climatic effects on populations. We evaluated several hypotheses of how climate impacts mountain pine beetle reproduction using an extensive 9-year dataset, in which nearly 10,000 trees were sampled across a region of approximately 90,000 km(2), that was recently invaded by the mountain pine beetle in Alberta, Canada. Our analysis supports the hypothesis of a positive effect of warmer winter temperatures on mountain pine beetle overwinter survival and provides evidence that the increasing trend in minimum winter temperatures over time in North America is an important driver of increased mountain pine beetle reproduction across the region. Although we demonstrate a consistent effect of warmer minimum winter temperatures on mountain pine beetle reproductive rates that is evident at the landscape and regional scales, this effect is overwhelmed by the effect of competition for resources within trees at the site level. Our results suggest that detection of the effects of a warming climate on bark beetle populations at small spatial scales may be difficult without accounting for negative density dependence due to competition for resources.
Date	AUG 2018
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed	15/03/2023, 14:50:42
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Volume	24
Pages	3620-3628

Publication Global Change Biology
DOI 10.1111/gcb.14284
Issue 8
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:51:19
Modified 15/03/2023, 14:51:19

Tags:

bark beetle, bark beetles, climate change, climate-change, cold tolerance, coleoptera, density dependence, dynamics, insect, maximum, minimum temperature trends, mountain pine-beetle, outbreak, population ecology, populations, range expansion

Attachments

- Full Text

The effects of soil eutrophication propagate to higher trophic levels

Type Journal Article
Author Juha Poyry
Author Luisa G. Carvalheiro
Author Risto K. Heikkinen
Author Ingolf Kuehn
Author Mikko Kuussaari
Author Oliver Schweiger
Author Anu Valtonen
Author Peter M. van Bodegom
Author Markus Franzen
Abstract Aim Nitrogen deposition is a major global driver of change in plant communities, but its impacts on higher trophic levels are insufficiently understood. Here, we introduce and test a novel conceptual trait-based model describing how the effects of soil eutrophication cascade to higher trophic levels across differential plant-herbivore interactions. Location Northern Europe. Methods We synthesize previous literature on the effects of nitrogen on plants and herbivorous insects as well as relevant multispecies patterns of insect communities concerning species dietary breadth, body size, dispersal propensity and voltinism in order to derive the model. We empirically evaluate the proposed, hitherto untested, four main model pathways using statistical modelling and data on 1064 northern European butterfly and moth species, their life-history traits, phylogeny and population trends. Results We show that across all species: (1) larval dietary breadth and host plant foliar nitrogen content are positively and equally strongly related to insect body size, and that (2) multivoltinism, host plant preferences for soil nitrogen, body size and larval dietary breadth are positively related to population trends of butterflies and moths as predicted by the model. Positive relationships between plant foliar nitrogen content and body size as well as multivoltinism and population trends are the first multispecies demonstrations for these patterns. Main conclusions Soil nitrogen enrichment amplifies the diverging trends of herbivorous insects feeding on nitrophilous versus nitrophobous plants through differential plant-herbivore

interactions, causing predictable changes in community composition at higher trophic levels. A positive foliar nitrogeninsect body size relationship, now empirically supported, is the integrating link within this cascade. As nitrogen deposition is a global driver, our model suggests that a major future trend may be an increased dominance of insects that are large, dispersive, multivoltine, dietary generalists or specialized on nitrophilous plant species at the expense of species preferring oligotrophic environments.

Date JAN 2017
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:04
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Volume 26
Pages 18-30
Publication Global Ecology and Biogeography
DOI 10.1111/geb.12521
Issue 1
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

biodiversity, body-size, british butterflies, Butterflies, climate, community change, conceptual model, eutrophication, extinctions, herbivory, homogenization, host plants, insect herbivores, insects, moths, nitrogen deposition, pollinators, population trends, species traits

Attachments

- Submitted Version

The effects of temperature extremes on survival in two semi-arid Australian bird communities over three decades, with predictions to 2104

Type Journal Article

Author Janet L. Gardner
Author Mark Clayton
Author Richard Allen
Author John Stein
Author Timothee Bonnet

Abstract Aim Organisms in arid and semi-arid regions are frequently exposed to climatic extremes and accordingly among the most vulnerable to climate change. Studies of seasonal differences in vital rates, which mediate effects of climate on viability, are rare in arid species, limiting ability to project population trends. We quantified survival patterns for two bird communities as a function of exposure to temperature extremes in winter and summer, then projected survival patterns to 2104. Location

Semi-arid eastern Australia. Time period 1986-2016; 1986-2104. Major taxa studied Birds. Methods Using mark-recapture time-dependent Cormack-Jolly-Seber models and data for 37 species from two >30-year ringing programmes, we tested for effects on 6-monthly survival of exposure to temperatures >38 and <0 degrees C. We then predicted future survival for different emission scenarios, testing whether changes in survival associated with warming winters would be sufficient to offset the effects of rising summer temperatures. Results Survival probability declined strongly with increasing exposure to days >38 degrees C and to a lesser extent to days <0 degrees C, with temperature extremes explaining 43 and 13% of temporal variation in survival among years, respectively. Summer survival patterns were similar across avian guilds but only survival of nectarivores declined in winter. Our models predict that gains in winter survival will not offset reductions in summer survival. Annual survival is predicted to decline substantially by the end of the century: from .63 in 1986 to .43 in 2104 under an optimistic emission scenario and to .11 under a pessimistic scenario. Main conclusions We highlight the significance of temperature extremes for species' persistence in arid and semi-arid regions, comprising 70% of Australia's landmass, and 40% globally. Our demography-based results are consistent with physiological-based projections evaluating avian survival in arid and semi-arid regions globally and suggest rising summer temperatures pose a risk to population persistence in these regions.

Date DEC 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:51:00
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Volume 31
Pages 2498-2509
Publication Global Ecology and Biogeography
DOI 10.1111/geb.13591
Issue 12
Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
Date Added 15/03/2023, 14:51:19
Modified 15/03/2023, 14:51:19

Tags:

arid zone, Australian birds, avian guilds, body condition, climate change, climate-change, energy and water, events, evolution, foraging behavior, impact, increases, landbirds, population projections, responses, species persistence, survival, temperature extremes, thermoregulation

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The global decline of freshwater megafauna

Type Journal Article
Author Fengzhi He
Author Christiane Zarfl
Author Vanessa Bremerich
Author Jonathan N. W. David

Author Zeb Hogan
Author Gregor Kalinkat
Author Klement Tockner
Author Sonja C. Jaehnig

Abstract Freshwater ecosystems are among the most diverse and dynamic ecosystems on Earth. At the same time, they are among the most threatened ecosystems but remain underrepresented in biodiversity research and conservation efforts. The rate of decline of vertebrate populations is much higher in freshwaters than in terrestrial or marine realms. Freshwater megafauna (i.e., freshwater animals that can reach a body mass >= 30 kg) are intrinsically prone to extinction due to their large body size, complex habitat requirements and slow life-history strategies such as long life span and late maturity. However, population trends and distribution changes of freshwater megafauna, at continental or global scales, remain unclear. In the present study, we compiled population data of 126 freshwater megafauna species globally from the Living Planet Database and available literature, and distribution data of 44 species inhabiting Europe and the United States from literature and databases of the International Union for Conservation of Nature and NatureServe. We quantified changes in population abundance and distribution range of freshwater megafauna species. Globally, freshwater megafauna populations declined by 88% from 1970 to 2012, with the highest declines in the Indomalaya and Palearctic realms (-99% and -97%, respectively). Among taxonomic groups, mega-fishes exhibited the greatest global decline (-94%). In addition, freshwater megafauna experienced major range contractions. For example, distribution ranges of 42% of all freshwater megafauna species in Europe contracted by more than 40% of historical areas. We highlight the various sources of uncertainty in tracking changes in populations and distributions of freshwater megafauna, such as the lack of monitoring data and taxonomic and spatial biases. The detected trends emphasize the critical plight of freshwater megafauna globally and highlight the broader need for concerted, targeted and timely conservation of freshwater biodiversity.

Date NOV 2019
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:16
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Volume 25
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Publication Global Change Biology
DOI 10.1111/gcb.14753
Issue 11
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

biodiversity, conservation, contraction, distribution, diversity, extinction, extinction risk, flagships, hydropower, indicators, patterns, population, range contraction, size, sturgeon, vertebrate

The interacting effects of food, spring temperature, and global climate cycles on population dynamics of a migratory songbird

Type Journal Article

Author Andrea K. Townsend
Author Evan G. Cooch
Author T. Scott Sillett
Author Nicholas L. Rodenhouse
Author Richard T. Holmes
Author Michael S. Webster

Abstract Although long-distance migratory songbirds are widely believed to be at risk from warming temperature trends, species capable of attempting more than one brood in a breeding season could benefit from extended breeding seasons in warmer springs. To evaluate local and global factors affecting population dynamics of the black-throated blue warbler (Setophaga caerulescens), a double-brooded long-distance migrant, we used Pradel models to analyze 25years of mark-recapture data collected in New Hampshire, USA. We assessed the effects of spring temperature (local weather) and the El Nino Southern Oscillation index (a global climate cycle), as well as predator abundance, insect biomass, and local conspecific density on population growth in the subsequent year. Local and global climatic conditions affected warbler populations in different ways. We found that warbler population growth was lower following El Nino years (which have been linked to poor survival in the wintering grounds and low fledging weights in the breeding grounds) than La Nina years. At a local scale, populations increased following years with warm springs and abundant late-season food, but were unaffected by spring temperature following years when food was scarce. These results indicate that the warming temperature trends might have a positive effect on recruitment and population growth of black-throated blue warblers if food abundance is sustained in breeding areas. In contrast, potential intensification of future El Nino events could negatively impact vital rates and populations of this species.

Date FEB 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:18
Extra Place: Hoboken Publisher: Wiley WOS:000369135400006
Volume 22
Pages 544-555
Publication Global Change Biology
DOI 10.1111/gcb.13053
Issue 2
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34
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Tags:

annual survival, avian population, bird population, Black-throated blue warbler, climate change, dendroica-caerulescens, El Nino Southern Oscillation, el nino/southern oscillation, long-term, mark-recapture, migratory songbird, model selection, neotropical migrant, north-atlantic oscillation, phenotypic mismatch, population dynamics, Pradel models, recruitment, Setophaga caerulescens

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The island syndrome in lizards

Type	Journal Article
Author	Maria Novosolov
Author	Pasquale Raia
Author	Shai Meiri
Abstract	Aim Islands are thought to promote correlated ecological and life-history shifts in species, including increased population density, and an infrequent production of few, large, offspring. These patterns are collectively termed the island syndrome. We present here the first, phylogenetically informed, global test of the island syndrome hypothesis, using lizards as our model organisms. Location World-wide. Methods We assembled a database containing 641 lizard species, their phylogenetic relationships, geographic ranges and the following life-history traits: female mass, clutch size, brood frequency, hatchling body mass and population density. We tested for life-history differences between insular and mainland forms in light of the island syndrome, controlling for mass and latitude, and for phylogenetic non-independence. We also examined the effects of population density and, in insular endemics, of island area, on lizard reproductive traits. Results We found that insular endemic lizards lay smaller clutches of larger hatchlings than closely related mainland lizards of similar size, as was expected by the island syndrome. In general, however, insular endemics lay more frequently than mainland ones. Species endemic to small islands lay as frequently as mainland species. Continental and insular lizards have similar productivity rates overall. Island area had little effect on lizard reproductive traits. No trait showed association with population density. Main conclusions Island endemic lizards mainly follow the island syndrome. We hypothesize that large offspring are favoured on islands because of increased intra-specific aggression and cannibalism by adults. Stable populations on islands lacking predators may likewise lead to increased intra-specific competition, and hence select for larger hatchlings that will quickly grow to adult size. This view is supported by the fact that lizard populations are denser on islands although population density per se was uncorrelated with any of the traits we examined.
Date	FEB 2013
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:21
Extra	Place: Hoboken Publisher: Wiley WOS:000313267000004
Volume	22
Pages	184-191
Publication	Global Ecology and Biogeography
DOI	10.1111/j.1466-8238.2012.00791.x
Issue	2

Journal Abbr Glob. Ecol. Biogeogr.
ISSN 1466-822X
Date Added 15/03/2023, 14:52:53
Modified 15/03/2023, 14:52:53

Tags:

adaptive significance, area, body-size evolution, Clutch size, density compensation, ecology, herbivory, insularity, island biogeography, island syndrome, life history, lizards, mammals, population density, reproduction, reversed island syndrome, rule, trends

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The sensitivity of breeding songbirds to changes in seasonal timing is linked to population change but cannot be directly attributed to the effects of trophic asynchrony on productivity

Type Journal Article
Author Samantha E. Franks
Author James W. Pearce-Higgins
Author Sian Atkinson
Author James R. Bell
Author Marc S. Botham
Author Tom M. Brereton
Author Richard Harrington
Author David I. Leech
Abstract A consequence of climate change has been an advance in the timing of seasonal events. Differences in the rate of advance between trophic levels may result in predators becoming mismatched with prey availability, reducing fitness and potentially driving population declines. Such trophic asynchrony is hypothesized to have contributed to recent population declines of long-distance migratory birds in particular. Using spatially extensive survey data from 1983 to 2010 to estimate variation in spring phenology from 280 plant and insect species and the egg-laying phenology of 21 British songbird species, we explored the effects of trophic asynchrony on avian population trends and potential underlying demographic mechanisms. Species which advanced their laying dates least over the last three decades, and were therefore at greatest risk of asynchrony, exhibited the most negative population trends. We expressed asynchrony as the annual variation in bird phenology relative to spring phenology, and related asynchrony to annual avian productivity. In warmer springs, birds were more asynchronous, but productivity was only marginally reduced; long-distance migrants, short-distance migrants and resident bird species all exhibited effects of similar magnitude. Long-term population, but not productivity, declines were greatest among those species whose annual productivity was most greatly reduced by asynchrony. This suggests that population change is not mechanistically driven by the negative effects of asynchrony on productivity. The apparent effects of asynchrony on population trends are therefore either more likely to be strongly expressed via other demographic pathways, or alternatively, are a surrogate for species' sensitivity to other environmental pressures which are the ultimate cause of decline.
Date MAR 2018
Language English
Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:05
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Volume 24
Pages 957-971
Publication Global Change Biology
DOI 10.1111/gcb.13960
Issue 3
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

citizen science, climate change, climate-change, declines, demography, green-up, long-distance migrant, migration, migration phenology, mismatch hypothesis, phenological response, phenology, population change, spring migration, term, trophic asynchrony, uk, wild bird

Attachments

- Accepted Version

Time-scale dependency of host plant biomass- and trait-mediated indirect effects of deer herbivory on a swallowtail butterfly

Type Journal Article
Author Shun Takagi
Author Tadashi Miyashita
Abstract Despite recent attempts to quantify the relative strength of density- and trait-mediated indirect effects, rarely has the issue been properly addressed at the population level. Most research is based on short-term small-scale experiments in which behavioural and/or physiological responses prevail. Here, we estimated the time-scales during which density- and trait-mediated effects manifest, as well as the strength of these effects, using an interaction chain with three organisms (deer-plant-butterfly). A hierarchical Bayesian model was performed by using a long-term data set of deer density in the Boso Peninsula, central Japan (where local densities differ spatially and temporally) as well as densities of the swallowtail butterfly Byasa alcinous and its host plant Aristolochia kaempferi. The time-scale effect of deer on plant quantity and quality was estimated according to the degree of carry-over effects. The negative influence on leaf density showed a temporal saturation pattern over the long term, while the positive influence on leaf quality due to resprouting of leaves after deer browsing showed no clear temporal trend. The net indirect effect changed from positive to negative with time, with the negative density-mediated effect becoming prominent in the long term. Our novel approach is widely applicable in assessing the dynamic impacts of wildlife if the spatio-temporal variability of expansion and/or invasion history is known.
Date NOV 2015
Language English

Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:03
Extra Place: Hoboken Publisher: Wiley WOS:000362741000021
Volume 84
Pages 1657-1665
Publication Journal of Animal Ecology
DOI 10.1111/1365-2656.12415
Issue 6
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

abundance, communities, density, Density-mediated indirect interactions (DMIIs), ecological memory, ecosystem management, impacts, insects, large herbivores, plant-animal interactions, quality, responses, Trait-mediated indirect interactions (TMIIs)

Trade-offs for food production, nature conservation and climate limit the terrestrial carbon dioxide removal potential

Type Journal Article

Author Lena R. Boysen
Author Wolfgang Lucht
Author Dieter Gerten

Abstract Large-scale biomass plantations (BPs) are a common factor in climate mitigation scenarios as they promise double benefits: extracting carbon from the atmosphere and providing a renewable energy source. However, their terrestrial carbon dioxide removal (tCDR) potentials depend on important factors such as land availability, efficiency of capturing biomass-derived carbon and the timing of operation. Land availability is restricted by the demands of future food production depending on yield increases and population growth, by requirements for nature conservation and, with respect to climate mitigation, avoiding unfavourable albedo changes. We integrate these factors in one spatially explicit biogeochemical simulation framework to explore the tCDR opportunity space on land available after these constraints are taken into account, starting either in 2020 or 2050, and lasting until 2100. We find that assumed future needs for nature protection and food production strongly limit tCDR potentials. BPs on abandoned crop and pasture areas (similar to 1,300 Mha in scenarios of either 8.0 billion people and yield gap reductions of 25% until 2020 or 9.5 billion people and yield gap reductions of 50% until 2050) could, theoretically, sequester similar to 100 GtC in land carbon stocks and biomass harvest by 2100. However, this potential would be similar to 80% lower if only cropland was available or similar to 50% lower if albedo decreases were considered as a factor restricting land availability. Converting instead natural forest, shrubland or grassland into BPs could result in much larger tCDR potentials. but at high environmental costs (e.g. biodiversity loss). The most promising avenue for effective tCDR seems to be improvement of efficient carbon utilization pathways,

changes in dietary trends or the restoration of marginal lands for the implementation of tCDR.

Date OCT 2017
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:51
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Volume 23
Pages 4303-4317
Publication Global Change Biology
DOI 10.1111/gcb.13745
Issue 10
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
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Modified 15/03/2023, 14:52:53

Tags:

bio-energy, bioenergy, biomass, climate change, co2 removal, ecosystem change, food production, impacts, land-use change, mitigation, model, plant geography, temperature, vegetation

Attachments

- Full Text

Twenty-five years of change in southern African passerine diversity: nonclimatic factors of change

Type Journal Article
Author Guillaume Peron
Author Res Altwegg
Abstract We analysed more than 25 years of change in passerine bird distribution in South Africa, Swaziland and Lesotho, to show that species distributions can be influenced by processes that are at least in part independent of the local strength and direction of climate change: land use and ecological succession. We used occupancy models that separate species' detection from species' occupancy probability, fitted to citizen science data from both phases of the Southern African Bird Atlas Project (1987-1996 and 2007-2013). Temporal trends in species' occupancy probability were interpreted in terms of local extinction/colonization, and temporal trends in detection probability were interpreted in terms of change in abundance. We found for the first time at this scale that, as predicted in the context of bush encroachment, closed-savannah specialists increased where open-savannah specialists decreased. In addition, the trend in the abundance of species a priori thought to be favoured by agricultural conversion was negatively correlated with human population density, which is in line with hypotheses explaining the decline in farmland birds in the Northern Hemisphere. In addition to climate, vegetation cover and the intensity and time since agricultural conversion constitute important predictors of biodiversity

changes in the region. Their inclusion will improve the reliability of predictive models of species distribution.

Date	SEP 2015
Language	English
Short Title	Twenty-five years of change in southern African passerine diversity
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed	15/03/2023, 14:47:31
Extra	Place: Hoboken Publisher: Wiley-Blackwell WOS:000360998400015
Volume	21
Pages	3347-3355
Publication	Global Change Biology
DOI	10.1111/gcb.12909
Issue	9
Journal Abbr	Glob. Change Biol.
ISSN	1354-1013
Date Added	15/03/2023, 14:47:34
Modified	15/03/2023, 14:47:34

Tags:

atlas data, biodiversity, birds, bush encroachment, citizen science, climate change, climate-change, communities, consequences, conservation planning, land-use, occupancy models, pesticide accumulation, range dynamics, South Africa, species distributions, species richness

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Under strong niche overlap conspecifics do not compete but help each other to survive: facilitation at the intraspecific level

Type	Journal Article
Author	Alex Fajardo
Author	Eliot J. B. McIntire
Abstract	1. Competition among conspecifics of the same cohort has been traditionally thought to be a main process driving population dynamics. In this classical view, however, the role of facilitation in stressful conditions has rarely been considered. Here, using a transplant experiment across a forest prairie gradient, we test whether the stress gradient hypothesis (SGH) extends to individuals thought to be strongly competing. 2. We transplanted 2-year-old seedlings of Nothofagus pumilio at two different densities (clusters of 10 and isolated) and at different distances from the forest edge (from 30 m inside the forest up to 50 in outside the forest in the prairie). We further stem-mapped all seedlings belonging to the clusters and computed a competition index (Cl). After 3 years of growing, survival and increment growth in diameter and height were measured and analysed using mixed-effects models. We conducted a nearest-neighbour analysis using seedlings' Cl and growth and computed model fit using the area under the curve (AUC) method. 3. Seedlings planted in dense clusters had significantly higher survival than solitary seedlings at the stressful end of the gradient. This trend was reversed at the opposite end of the gradient, supporting the SGH at the intraspecific level. Pursuing this at the level of the individual, we found that higher CIs (more neighbours) in seedlings predicted

higher probabilities of their survival (facilitation) in stressful conditions. 4. Seedlings diameter and height increment growth were not affected by planting density and only diameter varied along the stress gradient; seedlings had higher diameter increments in growth outside the forest. Finally, when compared with conceptual models, our results mostly support predictions of a higher facilitation at intermediate position along the gradient. 5. Synthesis. We showed that facilitation overrides competition among tree seedlings even at locations under moderate stress; the facilitation process occurs in resource-mediated interactions (niche overlapping). These results represent an important shift in our way to understand the density-dependent mortality process, and calls for a model reformulation including positive interactions even when competition is expected to be strongest (conspecifics of the same cohort).

Date	MAR 2011
Language	English
Short Title	Under strong niche overlap conspecifics do not compete but help each other to survive
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/3
Accessed	15/03/2023, 14:29:22
Extra	Place: Malden Publisher: Wiley-Blackwell WOS:000287785300030
Volume	99
Pages	642-650
Publication	Journal of Ecology
DOI	10.1111/j.1365-2745.2010.01771.x
Issue	2
Journal Abbr	J. Ecol.
ISSN	0022-0477
Date Added	15/03/2023, 14:29:40
Modified	15/03/2023, 14:29:40

Tags:

abiotic stress, area under the curve method, balance, competition, environments, forests, interference, Nothofagus pumilio, Patagonia, plant-communities, plant-plant interactions, populations, positive density-dependence, shrub, stress gradient hypothesis, stress gradients

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Understanding the role of species dynamics in abundance-occupancy relationships

Type	Journal Article
Author	Hannah L. Buckley
Author	Robert P. Freckleton
Abstract	P>1. The positive interspecific abundance-occupancy relationship (AOR) is a ubiquitous, but highly variable ecological pattern. Understanding this variation is a key challenge for community ecologists and little progress has been made using ecological trait data to predict variation in abundance and occupancy. 2. We used a data set from vascular plants in New Zealand South Island tussock grasslands measured at a landscape scale over 25 years to analyse AORs within a single habitat type. 3. We firstly modelled the interspecific relationship between abundance and occupancy across species. We then measured the deviations in the slopes of the

abundance-occupancy relationship for individual species from this overall interspecific relationship and related these slope deviations to data on species' life-history and ecological traits. 4. Highly invasive species that increased their ranges and abundances during the 25-year study period had significantly steeper slopes in abundance-occupancy space than the interspecific relationship although species with increased dispersal ability did not. Those species that were clonal showed significantly shallower slopes suggesting that clonality causes species to respond more slowly in occupancy than abundance to changes in their environment. 5. Synthesis. These results show that considering the population dynamics of individual species allows us to relate species' traits to their trajectory over time in abundance-occupancy space and thus can lead to a better understanding of the variation and scatter around the interspecific abundance-occupancy pattern.

Date MAY 2010
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:09
Extra Place: Hoboken Publisher: Wiley WOS:000276792400013
Volume 98
Pages 645-658
Publication Journal of Ecology
DOI 10.1111/j.1365-2745.2010.01650.x
Issue 3
Journal Abbr J. Ecol.
ISSN 0022-0477
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

abundance, british avifauna, competition, conservation, dispersal, distributions, ecology, local abundance, macroecology, occupancy, patterns, population dynamics, range size relationships, scale, temporal trends, traits, tussock grasslands

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Unraveling a century of global change impacts on winter bird distributions in the eastern United States

Type Journal Article

Author Sarah P. Saunders
Author Timothy D. Meehan
Author Nicole L. Michel
Author Brooke L. Bateman
Author William DeLuca
Author Jill L. Deppe
Author Joanna Grand
Author Geoffrey S. LeBaron
Author Lotem Taylor

Author Henrik Westerkam
Author Joanna X. Wu
Author Chad B. Wilsey

Abstract One of the most pressing questions in ecology and conservation centers on disentangling the relative impacts of concurrent global change drivers, climate and land-use/land-cover (LULC), on biodiversity. Yet studies that evaluate the effects of both drivers on species' winter distributions remain scarce, hampering our ability to develop full-annual-cycle conservation strategies. Additionally, understanding how groups of species differentially respond to climate versus LULC change is vital for efforts to enhance bird community resilience to future environmental change. We analyzed long-term changes in winter occurrence of 89 species across nine bird groups over a 90-year period within the eastern United States using Audubon Christmas Bird Count (CBC) data. We estimated variation in occurrence probability of each group as a function of spatial and temporal variation in winter climate (minimum temperature, cumulative precipitation) and LULC (proportion of group-specific and anthropogenic habitats within CBC circle). We reveal that spatial variation in bird occurrence probability was consistently explained by climate across all nine species groups. Conversely, LULC change explained more than twice the temporal variation (i.e., decadal changes) in bird occurrence probability than climate change on average across groups. This pattern was largely driven by habitat-constrained species (e.g., grassland birds, waterbirds), whereas decadal changes in occurrence probabilities of habitat-unconstrained species (e.g., forest passerines, mixed habitat birds) were equally explained by both climate and LULC changes over the last century. We conclude that climate has generally governed the winter occurrence of avifauna in space and time, while LULC change has played a pivotal role in driving distributional dynamics of species with limited and declining habitat availability. Effective land management will be critical for improving species' resilience to climate change, especially during a season of relative resource scarcity and critical energetic trade-offs.

Date APR 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/2
Accessed 15/03/2023, 14:50:58
Extra Place: Hoboken Publisher: Wiley WOS:000744944400001
Volume 28
Pages 2221-2235
Publication Global Change Biology
DOI 10.1111/gcb.16063
Issue 7
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:51:19
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Tags:

abundance, Audubon Christmas Bird Count, biodiversity, climate change, climate-change, community science, conservation, drivers, habitat-constrained, land-use change, occurrence probability, population trends, shifts, species distributions, urbanization

Unravelling the natural dynamics and resilience patterns of underwater Mediterranean forests: insights from the demography of the brown alga Cystoseira zosteroides

Type Journal Article

Author Pol Capdevila
Author Bernat Hereu
Author Juan Lluis Riera
Author Cristina Linares

Abstract Despite being among the most important habitat-forming organisms in temperate seas almost nothing is known about the demography of many algal species. This limits our ability to understand the effects of global and local stressors and to predict future trends under ongoing environmental change, which in turn hinders conservation actions.Cystoseira species develop important forest-like assemblages along the sublittoral zone in the Mediterranean Sea. In this study we investigated the natural population dynamics and resilience patterns of a deep-water brown and canopy-forming macroalga, Cystoseira zosteroides. We used density-dependent and stochastic matrix models to estimate its basic life-history and compare it with other relevant habitat-forming marine (brown algae) and terrestrial (plants) species. We also evaluated the consequences of increasing the disturbances caused by storms and the impact of lost fishing gear, and their interaction, on C. zosteroides population dynamics. The population dynamics of C. zosteroides showed similar patterns to terrestrial long-lived species such as shrubs and trees, with high survival due to their investment in structural biomass. Our data and models suggest that this species is able to buffer mortality pulses by increasing the number of recruits (and probably recruit survival) due to the new space liberated and, therefore, lower intraspecific competition. Nevertheless, when storm disturbances were more frequent than once every 50years, their populations collapsed, and this effect worsened when several stressors acted simultaneously. Our results improve our understanding about the demography of algal forests, and highlight the fact that increases in local and global stressors may erode the resilience of macroalgae, resulting in a loss of structural complexity in the benthic communities of temperate seas.Synthesis. Our findings reveal that deep-water C. zosteroides forests display slow population dynamics, similar to terrestrial perennials and trees. The increase in disturbance frequencies due to global and local stressors and their interaction will cause the decline of underwater macroalgal forests and may induce profound changes in their population and community dynamics.

Date NOV 2016
Language English
Short Title Unravelling the natural dynamics and resilience patterns of underwater Mediterranean forests
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:17
Extra Place: Hoboken Publisher: Wiley WOS:000385915200027
Volume 104
Pages 1799-1808
Publication Journal of Ecology
DOI 10.1111/1365-2745.12625
Issue 6

Journal Abbr J. Ecol.
ISSN 0022-0477
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Modified 15/03/2023, 14:28:28

Tags:

ascophyllum-nodosum, biodiversity, climate-change, density dependence, disturbance, disturbances, elasticity, life-history, life-history traits, long-term decline, lost fishing gear, macroalgae, matrix population models, population ecology, population-growth, quasi-extinction, seaweed, storms, traits, variability

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Unravelling the processes between phenotypic plasticity and population dynamics in migratory birds

Type Journal Article

Author Jin Liu
Author Weipan Lei
Author Xunqiang Mo
Author Chris J. Hassell
Author Zhengwang Zhang
Author Tim Coulson

Abstract Populations can rapidly respond to environmental change via adaptive phenotypic plasticity, which can also modify interactions between individuals and their environment, affecting population dynamics. Bird migration is a highly plastic resource-tracking tactic in seasonal environments. However, the link between the population dynamics of migratory birds and migration tactic plasticity is not well-understood. The quality of staging habitats affects individuals' migration timing and energy budgets in the course of migration and can consequently affect individuals' breeding and overwintering performance, and impact population dynamics. Given staging habitats being lost in many parts of the world, our goal is to investigate responses of individual migration tactics and population dynamics in the face of loss of staging habitat and to identify the key processes connecting them. We started by constructing and analysing a general full-annual-cycle individual-based model with a stylized migratory population to generate hypotheses on how changes in the size of staging habitat might drive changes in individual stopover duration and population dynamics. Next, through the interrogation of survey data, we tested these hypotheses by analysing population trends and stopover duration of migratory waterbirds experiencing the loss of staging habitat. Our modelling exercise led to us posing the following hypotheses: the loss of staging habitat generates plasticity in migration tactics, with individuals remaining on the staging habitat for longer to obtain food due to a reduction in per capita food availability. The subsequent increasing population density on the staging habitat has knock-on effects on population dynamics in the breeding and overwintering stage. Our empirical results were consistent with the modelling predictions. Our results demonstrate how environmental change that impacts one energetically costly life-history stage in migratory birds can have population dynamic impacts across the entire annual cycle via phenotypic plasticity.

Date MAY 2022
Language English
Library Catalogue Web of Science Nextgen

URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:27:55
Extra Place: Hoboken Publisher: Wiley WOS:000772226300001
Volume 91
Pages 983-995
Publication Journal of Animal Ecology
DOI 10.1111/1365-2656.13686
Issue 5
Journal Abbr J. Anim. Ecol.
ISSN 0021-8790
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

annual cycle, carrying capacity, china, climate-change, consequences, density-dependence, density-dependent, evolution, habitat quality, individual-based model, loss of staging habitat, migratory birds, population dynamics, red knots, responses, shorebirds, stopover duration, winter

Attachments

- Full Text

Variability in krill biomass links harvesting and climate warming to penguin population changes in Antarctica

Type Journal Article

Author Wayne Z. Trivelpiece
Author Jefferson T. Hinke
Author Aileen K. Miller
Author Christian S. Reiss
Author Susan G. Trivelpiece
Author George M. Watters

Abstract The West Antarctic Peninsula (WAP) and adjacent Scotia Sea support abundant wildlife populations, many of which were nearly extirpated by humans. This region is also among the fastest-warming areas on the planet, with 5-6 degrees C increases in mean winter air temperatures and associated decreases in winter sea-ice cover. These biological and physical perturbations have affected the ecosystem profoundly. One hypothesis guiding ecological interpretations of changes in top predator populations in this region, the "sea-ice hypothesis," proposes that reductions in winter sea ice have led directly to declines in "ice-loving" species by decreasing their winter habitat, while populations of "ice-avoiding" species have increased. However, 30 y of field studies and recent surveys of penguins throughout the WAP and Scotia Sea demonstrate this mechanism is not controlling penguin populations; populations of both ice-loving Adelie and ice-avoiding chinstrap penguins have declined significantly. We argue in favor of an alternative, more robust hypothesis that attributes both increases and decreases in penguin populations to changes in the abundance of their main prey, Antarctic krill. Unlike many other predators in this

region, Adelie and chinstrap penguins were never directly harvested by man; thus, their population trajectories track the impacts of biological and environmental changes in this ecosystem. Linking trends in penguin abundance with trends in krill biomass explains why populations of Adelie and chinstrap penguins increased after competitors (fur seals, baleen whales, and some fishes) were nearly extirpated in the 19th to mid-20th centuries and currently are decreasing in response to climate change.

Date	MAY 3 2011
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:28:07
Extra	Place: Washington Publisher: Natl Acad Sciences WOS:000290203100069
Volume	108
Pages	7625-7628
Publication	Proceedings of the National Academy of Sciences of the United States of America
DOI	10.1073/pnas.1016560108
Issue	18
Journal Abbr	Proc. Natl. Acad. Sci. U. S. A.
ISSN	0027-8424
Date Added	15/03/2023, 14:28:28
Modified	15/03/2023, 14:28:28

Tags:

adelie, chinstrap penguins, ecosystems, king-george-island, pygoscelis-antarctica, reproductive success, responses, sea-ice, south-shetland islands, whales

Attachments

- Full Text

Vast assembly of vocal marine mammals from diverse species on fish spawning ground

Type	Journal Article
Author	Delin Wang
Author	Heriberto Garcia
Author	Wei Huang
Author	Duong D. Tran
Author	Ankita D. Jain
Author	Dong Hoon Yi
Author	Zheng Gong
Author	J. Michael Jech
Author	Olav Rune Godo
Author	Nicholas C. Makris
Author	Purnima Ratilal

Abstract Observing marine mammal (MM) populations continuously in time and space over the immense ocean areas they inhabit is challenging but essential for gathering an unambiguous record of their distribution, as well as understanding their behaviour and interaction with prey species(1-6). Here we use passive ocean acoustic waveguide remote sensing (POAWRS)(7,8) in an important North Atlantic feeding ground(9,10) to instantaneously detect, localize and classify MM vocalizations from diverse species over an approximately 100,000 km(2) region. More than eight species of vocal MMs are found to spatially converge on fish spawning areas containing massive densely populated herring shoals at night-time(11-16) and diffuse herring distributions during daytime. We find the vocal MMs divide the enormous fish prey field into species-specific foraging areas with varying degrees of spatial overlap, maintained for at least two weeks of the herring spawning period. The recorded vocalization rates are diel (24 h)-dependent for all MM species, with some significantly more vocal at night and others more vocal during the day. The four key baleen whale species of the region: fin, humpback, blue and minke have vocalization rate trends that are highly correlated to trends in fish shoaling density and to each other over the diel cycle. These results reveal the temporospatial dynamics of combined multi-species MM foraging activities in the vicinity of an extensive fish prey field that forms a massive ecological hotspot, and would be unattainable with conventional methodologies. Understanding MM behaviour and distributions is essential for management of marine ecosystems and for accessing anthropogenic impacts on these protected marine species(1-5,17,18).

Date MAR 17 2016
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/1
Accessed 15/03/2023, 14:27:13
Extra Place: London Publisher: Nature Publishing Group WOS:000372064300052
Volume 531
Pages 366-+
Publication Nature
DOI 10.1038/nature16960
Issue 7594
Journal Abbr Nature
ISSN 0028-0836
Date Added 15/03/2023, 14:27:14
Modified 15/03/2023, 14:27:14

Tags:

eubalaena-glacialis, fin whales, foraging behavior, herring clupea-harengus, humpback whale songs, long-distance, ocean, orcinus-orca, passive source localization, transmission scintillation

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Vertebrate population trends are influenced by interactions between land use, climatic position, habitat loss and climate change

Type Journal Article
Author Jessica J. Williams
Author Robin Freeman

Author Fiona Spooner
Author Tim Newbold

Abstract Rapid human-driven environmental changes are impacting animal populations around the world. Currently, land-use and climate change are two of the biggest pressures facing biodiversity. However, studies investigating the impacts of these pressures on population trends often do not consider potential interactions between climate and land-use change. Further, a population's climatic position (how close the ambient temperature and precipitation conditions are to the species' climatic tolerance limits) is known to influence responses to climate change but has yet to be investigated with regard to its influence on land-use change responses over time. Consequently, important variations across species' ranges in responses to environmental changes may be being overlooked. Here, we combine data from the Living Planet and BioTIME databases to carry out a global analysis exploring the impacts of land use, habitat loss, climatic position, climate change and the interactions between these variables, on vertebrate population trends. By bringing these datasets together, we analyse over 7,000 populations across 42 countries. We find that land-use change is interacting with climate change and a population's climatic position to influence rates of population change. Moreover, features of a population's local landscape (such as surrounding land cover) play important roles in these interactions. For example, populations in agricultural land uses where maximum temperatures were closer to their hot thermal limit, declined at faster rates when there had also been rapid losses in surrounding semi-natural habitat. The complex interactions between these variables on populations highlight the importance of taking intraspecific variation and interactions between local and global pressures into account. Understanding how drivers of change are interacting and impacting populations, and how this varies spatially, is critical if we are to identify populations at risk, predict species' responses to future environmental changes and produce suitable conservation strategies.

Date FEB 2022
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/1
Accessed 15/03/2023, 14:47:09
Extra Place: Hoboken Publisher: Wiley WOS:000722747400001
Volume 28
Pages 797-815
Publication Global Change Biology
DOI 10.1111/gcb.15978
Issue 3
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:47:34
Modified 15/03/2023, 14:47:34

Tags:

biodiversity, BioTIME, forests, global, grassland birds, hotspots, impacts, land-use change, landscapes, Living Planet database, maps, population trends, precipitation, range, temperature, time-series, vertebrates

Attachments

- Submitted Version

Victims of ancient hyperthermal events herald the fates of marine clades and traits under global warming

Type Journal Article
Author Carl J. Reddin
Author Adam T. Kocsis
Author Martin Aberhan
Author Wolfgang Kiessling

Abstract Organismic groups vary non-randomly in their vulnerability to extinction. However, it is unclear whether the same groups are consistently vulnerable, regardless of the dominant extinction drivers, or whether certain drivers have their own distinctive and predictable victims. Given the challenges presented by anthropogenic global warming, we focus on changes in extinction selectivity trends during ancient hyperthermal events: geologically rapid episodes of global warming. Focusing on the fossil record of the last 300 million years, we identify clades and traits of marine ectotherms that were more prone to extinction under the onset of six hyperthermal events than during other times. Hyperthermals enhanced the vulnerability of marine fauna that host photosymbionts, particularly zooxanthellate corals, the reef environments they provide, and genera with actively burrowing or swimming adult life-stages. The extinction risk of larger sized fauna also increased relative to non-hyperthermal times, while genera with a poorly buffered internal physiology did not become more vulnerable on average during hyperthermals. Hyperthermal-vulnerable clades include rhynchonelliform brachiopods and bony fish, whereas resistant clades include cartilaginous fish, and ostreid and venerid bivalves. These extinction responses in the geological past mirror modern responses of these groups to warming, including range-shift magnitudes, population losses, and experimental performance under climate-related stressors. Accordingly, extinction mechanisms distinctive to rapid global warming may be indicated, including sensitivity to warming-induced seawater deoxygenation. In anticipation of modern warming-driven marine extinctions, the trends illustrated in the fossil record offer an expedient preview.

Date FEB 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed 15/03/2023, 14:52:24
Extra Place: Hoboken Publisher: Wiley WOS:000591812500001
Volume 27
Pages 868-878
Publication Global Change Biology
DOI 10.1111/gcb.15434
Issue 4
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:52:53
Modified 15/03/2023, 14:52:53

Tags:

biodiversity, body-size, climate change, climate-change, diversity dynamics, extinction, extinction risk, fossil, limits, metabolic activity, ocean acidification, oxygen, photosymbiont, selectivity, temperatures

Attachments

- Full Text

Warfare and wildlife declines in Africa's protected areas

Type	Journal Article
Author	Joshua H. Daskin
Author	Robert M. Pringle
Abstract	Large-mammal populations are ecological linchpins(1), and their worldwide decline(2) and extinction(3) disrupts many ecosystem functions and services(4). Reversal of this trend will require an understanding of the determinants of population decline, to enable more accurate predictions of when and where collapses will occur and to guide the development of effective conservation and restoration policies(2,5). Many correlates of large-mammal declines are known, including low reproductive rates, overhunting, and habitat destruction(2,6,7). However, persistent uncertainty about the effects of one widespread factor-armed conflict-complicates conservation-planning and priority-setting efforts(5,8). Case studies have revealed that conflict can have either positive or negative local impacts on wildlife(8-10), but the direction and magnitude of its net effect over large spatiotemporal scales have not previously been quantified(5). Here we show that conflict frequency predicts the occurrence and severity of population declines among wild large herbivores in African protected areas from 1946 to 2010. Conflict was extensive during this period, occurring in 71% of protected areas, and conflict frequency was the single most important predictor of wildlife population trends among the variables that we analysed. Population trajectories were stable in peacetime, fell significantly below replacement with only slight increases in conflict frequency (one conflict-year per two-to-five decades), and were almost invariably negative in high-conflict sites, both in the full 65-year dataset and in an analysis restricted to recent decades (1989-2010). Yet total population collapse was infrequent, indicating that war-torn faunas can often recover. Human population density was also correlated (positively) with wildlife population trajectories in recent years; however, we found no significant effect, in either timespan, of species body mass, protected-area size, conflict intensity (human fatalities), drought frequency, presence of extractable mineral resources, or various metrics of development and governance. Our results suggest that sustained conservation activity in conflict zones-and rapid interventions following ceasefires-may help to save many at-risk populations and species.
Date	JAN 18 2018
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed	15/03/2023, 14:28:17
Extra	Place: Berlin Publisher: Nature Research WOS:000423475100049
Volume	553
Pages	328-+
Publication	Nature

DOI 10.1038/nature25194
Issue 7688
Journal Abbr Nature
ISSN 0028-0836
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

armed-conflict, conservation, drought, extinction risk, impact, models, population declines, rainfall, spatial autocorrelation, war

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Warming and shifting phenology accelerate an invasive plant life cycle

Type Journal Article
Author Joseph A. Keller
Author Katriona Shea
Abstract Numerous studies have documented changes in the seasonal timing of organisms' growth and reproduction in response to climate warming. These changes correlate with documented changes in species' abundance, but mechanisms linking these trends remain elusive. We investigated the joint demographic effects of advanced reproductive phenology and warming on a globally invasive plant (Carduus nutans) in a field experiment, documenting a substantial shift toward completion of the life cycle at younger ages. Demographic modeling projected 71% of warmed individuals flower as annuals, compared to 61% under current conditions. As this species only reproduces once, this represents a major acceleration of the life cycle. We project a 15% increase in this invader's population growth rate. We show that rising temperatures accelerate this invasive species' population growth by increasing the average size of reproducing individuals; increasing the proportion of individuals that survive to reproduce; and increasing the fraction that reproduce as annuals. Major increases in population growth in this, and potentially many other, invasive species will threaten food security and require careful planning to avoid significant environmental and economic impacts.
Date JAN 2021
Language English
Library Catalogue Web of Science Nextgen
URL https://www.webofscience.com/wos/woscc/summary/d19fa927-2acf-47b2-ba28-a86cce412229-791e52f8/relevance/2
Accessed 15/03/2023, 14:28:22
Extra Place: Hoboken Publisher: Wiley WOS:000590680700001
Volume 102
Publication Ecology
DOI 10.1002/ecy.3219
Issue 1
Journal Abbr Ecology
ISSN 0012-9658
Date Added 15/03/2023, 14:28:28
Modified 15/03/2023, 14:28:28

Tags:

biocontrol agent, Carduus nutans, carduus-nutans, climate change, climate-change, demography, driven, dynamics, fitness, impact, integral projection model, invasive species, life cycle, models, phenology, responses

Attachments

- Full Text

Warming of Subarctic waters accelerates development of a key marine zooplankton Calanus finmarchicus

Type	Journal Article
Author	Agata Weydmann
Author	Waldemar Walczowski
Author	Jacob Carstensen
Author	Slawomir Kwasniewski
Abstract	Recent observations confirm the rising temperatures of Atlantic waters transported into the Arctic Ocean via the West Spitsbergen Current (WSC). We studied the overall abundance and population structure of the North Atlantic keystone zoo-plankton copepod Calanus finmarchicus, which is the main prey for pelagic fish and some seabirds, in relation to selected environmental variables in this area between 2001 and 2011, when warming in the Arctic and Subarctic was particularly pronounced. Sampling within a 3-week time window each summer demonstrated that trends in the overall abundance of C. finmarchicus varied between years, with the highest values in "extreme" years, due to high numbers of nauplii and early cope-podite stages in colder years (2001, 2004, 2010), and contrary to that, the fifth copepodite stage (C5) peaking in warm years (2006, 2007, 2009). The most influential environmental variable driving C. finmarchicus life cycle was temperature, which promoted an increased C5 abundance when the temperature was above 6 degrees C, indicating earlier spawning and/or accelerated development, and possibly leading to their development to adults later in the summer and spawning for the second time, given adequate food supply. Based on the presented high interannual and spatial variability, we hypothesize that under a warmer climate, C. finmarchicus may annually produce two generations in the southern part of the WSC, what in turn could lead to food web reorganization of important top predators, such as little auks, and induce northward migrations of fish, especially the Norwegian herring.
Date	JAN 2018
Language	English
Library Catalogue	Web of Science Nextgen
URL	https://www.webofscience.com/wos/woscc/summary/32789394-31b5-4c1d-8f43-0b3dc38a752d-791fb2b3/relevance/3
Accessed	15/03/2023, 14:52:29
Extra	Place: Hoboken Publisher: Wiley WOS:000426506100043
Volume	24
Pages	172-183
Publication	Global Change Biology
DOI	10.1111/gcb.13864

Issue 1
Journal Abbr Glob. Change Biol.
ISSN 1354-1013
Date Added 15/03/2023, 14:52:53
Modified 15/03/2023, 14:52:53

Tags:

1997 spring bloom, Arctic, atlantification, Calanus, climate change, climate-change, copepod, egg-production, environmental-conditions, fish migrations, foraging behavior, glacialis, northern north-atlantic, norwegian sea, plankton, seabirds, temperature, West Spitsbergen Current

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When species become generalists: on-going large-scale changes in bird habitat specialization

Type Journal Article

Author Jean Yves Barnagaud
Author Vincent Devictor
Author Frederic Jiguet
Author Frederic Archaux

Abstract Aim Species specialization is often considered as a stable species characteristic over the short term. However, this assumption has hardly been tested, even though it may impair our ability to track the impoverishment of biodiversity induced by the rapid replacement of specialists by generalists. We tested whether species specialization in birds varied over a short period of time, and assessed whether variations in species specialization influence community-level metrics of biotic homogenization. Location France. Methods We studied the variations in specialization to habitat closure of 94 bird species over the period 2002-08, accounting for species variations in mean density, habitat preference and migratory status. We then quantified the temporal changes in a community specialization index, which measures functional homogenization. Results Specialization decreased over time for 35 species (37%), while 46 (49%) showed non-significant negative trends and 13 (14%) had null or non-significant positive trends. The more a species was specialized at the beginning of the study, the more it generalized. We additionally found that changes in the specialization level were density dependent: 34 species (36%) became more generalist in years of higher densities while only one became more specialized. At the community level, accounting for this inter-annual variability in species specialization accentuated the trend in the functional homogenization of bird communities. Main conclusions Habitat specialization is a labile ecological trait, which may change in the short term following habitat degradation, density dependence and source-sink dynamics. Accounting for short-term temporal variations in observed habitat specialization of species can increase our understanding of the effects of global changes on species strategies and community dynamics.

Date JUL 2011
Language English
Short Title When species become generalists
Library Catalogue Web of Science Nextgen
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Extra Place: Malden Publisher: Wiley-Blackwell WOS:000291391500011
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Publication Global Ecology and Biogeography
DOI 10.1111/j.1466-8238.2010.00629.x
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Journal Abbr Glob. Ecol. Biogeogr.
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Tags:

abundance, Bird communities, communities, diversity, ecological specialization, functional homogenization, functional traits, global changes, habitat gradient, homogenization, landscapes, niche, population-dynamics, size, specialization, temporal variations

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When to start and when to stop: Effects of climate on breeding in a multi-brooded songbird

Type Journal Article

Author Lei Lv
Author Yang Liu
Author Helen L. Osmond
Author Andrew Cockburn
Author Loeske E. B. Kruuk

Abstract Climate warming has been shown to affect the timing of the onset of breeding of many bird species across the world. However, for multi-brooded species, climate may also affect the timing of the end of the breeding season, and hence also its duration, and these effects may have consequences for fitness. We used 28 years of field data to investigate the links between climate, timing of breeding, and breeding success in a cooperatively breeding passerine, the superb fairy-wren (Malurus cyaneus). This multi-brooded species from southeastern Australia has a long breeding season and high variation in phenology between individuals. By applying a "sliding window" approach, we found that higher minimum temperatures in early spring resulted in an earlier start and a longer duration of breeding, whereas less rainfall and more heatwaves (days > 29 degrees C) in late summer resulted in an earlier end and a shorter duration of breeding. Using a hurdle model analysis, we found that earlier start dates did not predict whether or not females produced any young in a season. However, for successful females who produced at least one young, earlier start dates were associated with higher numbers of young produced in a season. Earlier end dates were associated with a higher probability of producing at least one young, presumably because unsuccessful females kept trying when others had ceased. Despite larger scale trends in climate, climate variables in the windows relevant to this species' phenology did not change across years, and there were no temporal trends in phenology during our study period. Our results illustrate a scenario in which higher temperatures advanced both start and end dates of individuals' breeding seasons, but did not generate an overall temporal shift in

breeding times. They also suggest that the complexity of selection pressures on breeding phenology in multi-brooded species may have been underestimated.

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birds, breeding phenology, breeding success, climate, constraints, fitness, great tit, impact, Malurus cyaneus, migration, phenology, population, rainfall, reproductive success, selection, shifts, temperature

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Why do parasites exhibit reverse latitudinal diversity gradients? Testing the roles of host diversity, habitat and climate

Type	Journal Article
Author	Pieter Johnson
Author	Sarah E. Haas
Abstract	Aim The latitudinal diversity gradient (LDG), in which species richness decreases from the equator towards the poles, is among the most fundamental distributional patterns in ecology. Despite the expectation that the diversity of parasites tracks that of their hosts, available evidence suggests that many parasites exhibit reverse latitudinal gradients or no pattern, yet the rarity of large-scale datasets on host-parasite interactions calls into question the robustness of such trends. Here, we collected parasitological data from a host group of conservation importance, lentic-breeding amphibians, to characterize the form and direction of relationships among latitude, parasite richness and parasite load. Location The contiguous USA. Time period 2000-2014. Major taxa studied Lentic-breeding frogs and toads and their helminth parasites. Methods We collected information on parasite richness and infection load for 846 amphibian populations representing 31 species. We combined these data with environmental and biological data to test for LDGs and potential mechanisms. Results Both parasite richness and parasite abundance increased across 20 degrees of latitude (i.e., a reverse LDG). For parasite richness, this pattern was explained, in part, by latitudinal increases in wetland area, land-cover diversity and the richness of waterbirds, which function as definitive hosts for many amphibian parasites. Host body size also correlated positively with latitude and helminth richness, potentially reflecting increased habitat availability, greater host longevity

or a persistent phylogenetic signal. Parasite abundance associated positively with wetland area and land-cover diversity, but negatively with amphibian taxonomic richness. Longitude exhibited nonlinear relationships with parasite abundance and richness, which we suggest stem from large-scale variation in host availability (e.g., migratory bird flyways). Main conclusions With growing interest in the distribution of parasites and pathogens, these results highlight the importance of inverse latitudinal gradients while emphasizing the explanatory influence of host body size, habitat availability and host diversity.

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Language	English
Short Title	Why do parasites exhibit reverse latitudinal diversity gradients?
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amphibian decline, biodiversity, communities, disease, drivers, ecology, energy-richness hypothesis, homage, host diversity, infectious disease, latitudinal diversity gradient, macroecology, migratory bird flyways, parasite species richness, patterns, perspective, scale, seasonality, species richness, trematode

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Wild bees as winners and losers: Relative impacts of landscape composition, quality, and climate

Type	Journal Article
Author	Melanie Kammerer
Author	Sarah C. Goslee
Author	Margaret R. Douglas
Author	John F. Tooker
Author	Christina M. Grozinger

Abstract Wild bees, like many other taxa, are threatened by land-use and climate change, which, in turn, jeopardizes pollination of crops and wild plants. Understanding how land-use and climate factors interact is critical to predicting and managing pollinator populations and ensuring adequate pollination services, but most studies have evaluated either land-use or climate effects, not both. Furthermore, bee species are incredibly variable, spanning an array of behavioral, physiological, and life-history traits that can increase or decrease resilience to land-use or climate change. Thus, there are likely bee species that benefit, while others suffer, from changing climate and land use, but few studies have documented taxon-specific trends. To address these critical knowledge gaps, we analyzed a long-term dataset of wild bee occurrences from Maryland, Delaware, and Washington DC, USA, examining how different bee genera and functional groups respond to landscape composition, quality, and climate factors. Despite a large body of literature documenting land-use effects on wild bees, in this study, climate factors emerged as the main drivers of wild-bee abundance and richness. For wild-bee communities in spring and summer/fall, temperature and precipitation were more important predictors than landscape composition, landscape quality, or topography. However, relationships varied substantially between wild-bee genera and functional groups. In the Northeast USA, past trends and future predictions show a changing climate with warmer winters, more intense precipitation in winter and spring, and longer growing seasons with higher maximum temperatures. In almost all of our analyses, these conditions were associated with lower abundance of wild bees. Wild-bee richness results were more mixed, including neutral and positive relationships with predicted temperature and precipitation patterns. Thus, in this region and undoubtedly more broadly, changing climate poses a significant threat to wild-bee communities.

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Wildlife population trends in protected areas predicted by national socio-economic metrics and body size

Type Journal Article
Author Megan D. Barnes
Author Ian D. Craigie
Author Luke B. Harrison
Author Jonas Geldmann

Author Ben Collen
Author Sarah Whitmee
Author Andrew Balmford
Author Neil D. Burgess
Author Thomas Brooks
Author Marc Hockings
Author Stephen Woodley

Abstract Ensuring that protected areas (PAs) maintain the biodiversity within their boundaries is fundamental in achieving global conservation goals. Despite this objective, wildlife abundance changes in PAs are patchily documented and poorly understood. Here, we use linear mixed effect models to explore correlates of population change in 1,902 populations of birds and mammals from 447 PAs globally. On an average, we find PAs are maintaining populations of monitored birds and mammals within their boundaries. Wildlife population trends are more positive in PAs located in countries with higher development scores, and for larger-bodied species. These results suggest that active management can consistently overcome disadvantages of lower reproductive rates and more severe threats experienced by larger species of birds and mammals. The link between wildlife trends and national development shows that the social and economic conditions supporting PAs are critical for the successful maintenance of their wildlife populations.

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Attachments

- Full Text