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# GBits Science Supplement

**No. 1, March 2012**

The Global Biodiversity Information Facility exists to benefit science and society, by promoting free and open access to data via the Internet. A measure of its progress is the extent to which data mobilized by GBIF's many publishers are being used in scientific research, supporting targets to reduce biodiversity loss. This new supplement aims to communicate the uses of GBIF-mediated data on a regular basis.

The supplement is published alongside the bimonthly GBits newsletter, which provides a range of news about biodiversity data publishing from around the GBIF community. If you are not already a subscriber, you can access GBits here and follow the instructions if you would like to sign up.

The research papers cited below are all included in a virtual 'GBIF Public Library' using the Mendeley academic social network platform. More than 1,200 GBIF-related papers are tagged according to the type of use, subject matter and geographical location. The library is constantly being updated with new research, and you can browse and search it online here. You will also find instructions there for downloading the Mendeley desktop version which allows you to share, annotate and add papers.

The GBIF secretariat communications team hopes you find this science supplement interesting and useful, and we would greatly appreciate feedback.

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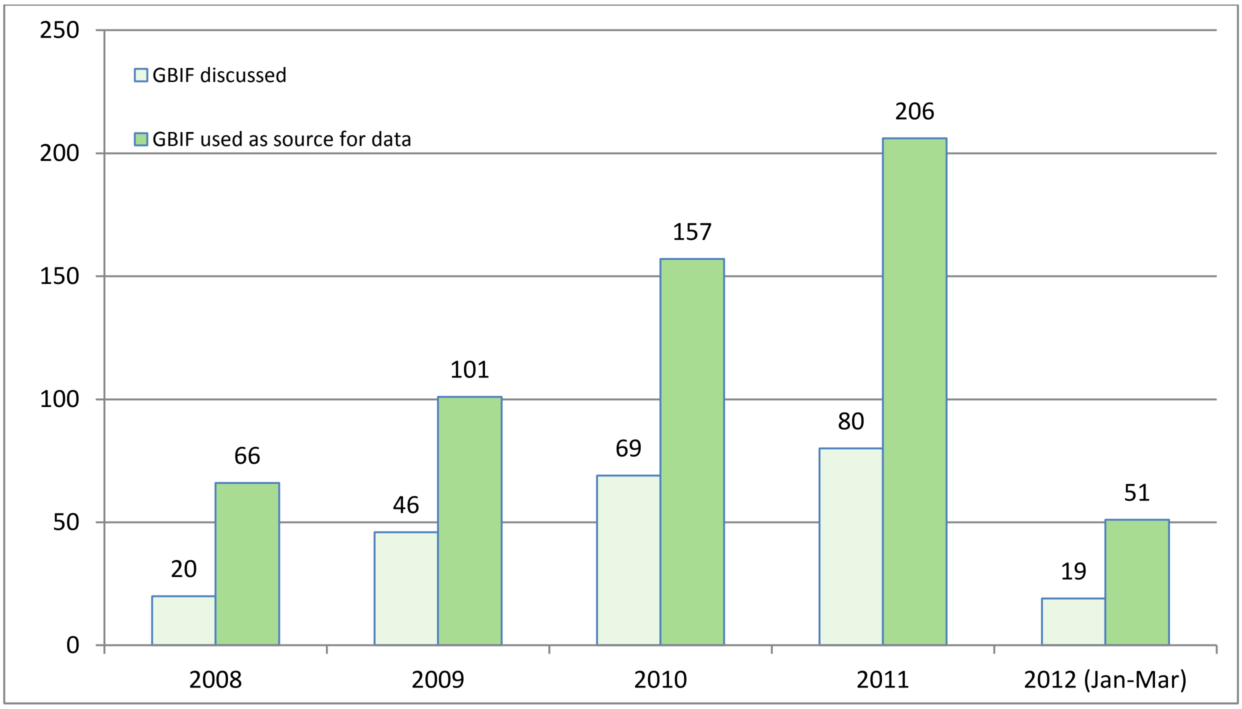

*Use and discussion of GBIF in scientific literature, 2008-12 (number of peer-reviewed, published research papers)*

# Research citing GBIF as a source of data, Jan-Mar 2012

## Grouped by relevance to Aichi Biodiversity Targets[1]:

**Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society**

***Target 2. Integrate biodiversity values into development and planning***

**Example**: Willis, K.J. et al., in press. Determining the ecological value of landscapes beyond protected areas. *Biological Conservation*. Available at: http://www.sciencedirect.com/science/article/pii/S0006320711003995

**Summary**: The paper describes the methodology of the Local Ecological Footprint Tool (LEFT), aimed at providing fine-scale calculations of relative ecological value to help in the siting of industrial and other types of development. It uses globally-available databases and models to provide a score for every 300m parcel, based on five key ecological features (biodiversity, vulnerability, fragmentation, connectivity and resilience).

The study demonstrates the potential of the tool in three regions in Algeria, the Russian Federation and Canada. To obtain biodiversity values, LEFT extracts all appropriate species occurrence records from the GBIF data index for the same ecological region as the study area, and uses ecological niche modeling to predict their distribution at very fine scales.

Lead author Kathy Willis of the Oxford Biodiversity Institute comments: “The species occurrence data obtained through GBIF is a fundamental part of this tool.”

[1] Agreed by 193 governments in Nagoya, Japan, in 2010. http://www.cbd.int/sp/targets/

## Strategic Goal B – Reduce direct pressures and promote sustainable use

### *Target 6. Sustainable fisheries*

Jones, M.C. et al., 2012. Modelling commercial fish distributions: Prediction and assessment using different approaches. *Ecological Modelling*, 225, p.133-145. Available at: http://linkinghub.elsevier.com/retrieve/pii/S0304380011005217

### *Target 7. Sustainable agriculture and forestry*

Schroder, W. & Schmidt, G., 2012. Overview of principles and implementations to deal with spatial issues in monitoring environmental effects of genetically modified organisms. *Environmental Sciences Europe*, 24(6). Available at: http://www.enveurope.com/content/24/1/6

Tao, G. et al., 2012. Biomass properties in association with plant species and assortments. II: A synthesis based on literature data for ash elements. *Renewable and Sustainable Energy Reviews*, online, p.1-16. Available at: http://linkinghub.elsevier.com/retrieve/pii/S136403211200024X

### *Target 9. Invasive alien species*

**Example**: Zhu, G. et al., 2012. Potential Geographic Distribution of Brown Marmorated Stink Bug Invasion (Halyomorpha halys) B. Fenton, ed. *PLoS ONE*, 7(2), p.e31246. Available at: http://dx.plos.org/10.1371/journal.pone.0031246.

**Summary***:* The research explores the climatic niche occupied by a pest causing widespread agricultural damage, with a rapidly expanding range in North America and Europe. To model the potential spread of the bug, it uses occurrence records from its native range in east Asia, obtained partly from databases in Japan, South Korea and Taiwan publishing data through GBIF.

Using these models, the study mapped areas at risk of invasion from the pest in northern Europe, northeastern North America, southern Australia, North Island New Zealand, Angola and Uruguay. The authors hope this will provide critical information for management strategies.

Bhagwat, S. a et al., 2012. A Battle Lost? Report on Two Centuries of Invasion and Management of Lantana camara L. in Australia, India and South Africa A. Traveset, ed. *PLoS ONE*, 7(3), p.e32407. Available at: http://dx.plos.org/10.1371/journal.pone.0032407

Capinha, C., Anastácio, P. & Tenedório, J.A., 2012. Predicting the impact of climate change on the invasive decapods of the Iberian inland waters: an assessment of reliability. *Biological Invasions*, online. Available at: http://www.springerlink.com/index/10.1007/s10530-012-0187-z

Larson, E.R. & Olden, J.D., 2012. Using avatar species to model the potential distribution of emerging invaders. *Global Ecology and Biogeography*, online, p.no-no. Available at: http://doi.wiley.com/10.1111/j.1466-8238.2012.00758.x

MacGown, J.A. & Wetterer, J.K., 2012. Geographic spread of Pyramica hexamera. *Terrestrial Arthropod Reviews*, 5(1), p.3-14. Available at: http://www.ingentaconnect.com/content/brill/tar/2012/00000005/00000001/art00002

MacGown, J.A. & Wetterer, J.K., 2012. Geographic Spread of Gnamptogenys triangularis (Hymenoptera: Formicidae: Ectatomminae). *Psyche A Journal of Entomology*, 2012, p.1-4. Available at: http://www.hindawi.com/journals/psyche/2012/571430/

Stengaard Hansen, L. et al., 2012. Future pest status of an insect pest in museums, Attagenus smirnovi: Distribution and food consumption in relation to climate change. *Journal of Cultural Heritage*, 13(1), p.22-27. Available at: http://linkinghub.elsevier.com/retrieve/pii/S1296207411000549

Ware, C. et al., 2011. Humans introduce viable seeds to the Arctic on footwear. *Biological Invasions*, 14(3), p.567-577. Available at: http://www.springerlink.com/index/10.1007/s10530-011-0098-4

Wetterer, J.K., 2012. Worldwide spread of Emery's sneaking ant, Cardiocondyla emeryi (Hymenoptera: Formicidae). *Myrmecological News*, 17, p.13-20. Available at: http://www.myrmecologicalnews.org/cms/images/pdf/online_earlier/mn17_13-20_non-printable.pdf

Wetterer, J.K., Kronauer, D.J.C. & Borowiec, M.L., 2012. Worldwide spread of Cerapachys biroi (Hymenoptera: Formicidae: Cerapachyinae). *Myrmecological News*, online, p.1-4. Available at: http://www.myrmecologicalnews.org/cms/images/pdf/online_earlier/mn17_1-4_non-printable.pdf

### *Target 10. Climate change impacts*

**Example:** Alsos, I.G. et al., 2012. Genetic consequences of climate change for northern plants. *Proceedings of the Royal Society B: Biological Sciences*, online (January). Available at: http://www.ncbi.nlm.nih.gov/pubmed/22217725

**Summary:** The research investigates how loss of range for many species due to climate change may affect genetic diversity, crucial to their long-term persistence. It analyses the genetic diversity of 27 northern plant species, using nearly 10,000 DNA samples from 1,200 populations. Among other data, it uses validated GBIF-mediated occurrence points for those species to predict the loss of range and genetic diversity by 2080, employing a number of models and scenarios. The projected loss of genetic diversity varies widely among species, depending partly on the ability of plants to disperse over long distances. According to at least one scenario, all 27 species were predicted to lose genetic diversity.

Calkins, M.T. et al., 2012. Not-so-splendid isolation: modeling climate-mediated range collapse of a montane mammal Ochotona princeps across numerous ecoregions. *Ecography*, (online), p.no-no. Available at: http://doi.wiley.com/10.1111/j.1600-0587.2011.07227.x

Hof. A. et al., 2012. How biotic interactions may alter future predictions of species distributions: future threats to the persistence of the arctic fox in Fennoscandia. *Diversity and distributions*. Available at: http://doi.wiley.com/10.1111/j.1472-4642.2011.00876.x

Müller, E. et al., 2012. Frequency of local, regional, and long-distance dispersal of diploid and tetraploid Saxifraga oppositifolia (Saxifragaceae) to Arctic glacier forelands. *American Journal of Botany*, 99(3), p.459-71. Available at: http://www.ncbi.nlm.nih.gov/pubmed/22371855

Rombouts, I., Beaugrand, G. & Dauvin, J., 2012. Potential changes in benthic macrofaunal distributions from the English Channel simulated under climate change scenarios. *Estuarine, Coastal and Shelf Science* Online (January) p. 1-9. Available at: http://linkinghub.elsevier.com/retrieve/pii/S0272771411005488

### *Target 11. Extinctions and threats*

Fisher, R. & Ineich, I., 2012. Cryptic extinction of a common Pacific lizard Emoia impar (Squamata, Scincidae) from the Hawaiian Islands. *Oryx*, online. Available at: http://journals.cambridge.org/abstract_S0030605310001778

Gil, G.E. & Lobo, J.M., 2012. Situación Del Zorro Vinagre (Speothos Venaticus) En El Extremo Sur De Su Distribución (Argentina). *Intercenicia*, 37(1), p.21-28. Available at: http://xa.yimg.com/kq/groups/28662970/1468922882/name/GilyLobo2012.pdf http://www.interciencia.org/

Restrepo-Aristizábal, A., Heggestad, V. & Acuña-Rodríguez, I.S., 2012. Applied Landscape Ecology, Future Socioeconomics and Policy-Making in the Neotropics. In J. Tiefenbacher, ed. *Perspectives on Nature Conservation – Patterns, Pressures and Prospects*. InTech, p. 270. Available at: http://cdn.intechopen.com/pdfs/29849/InTech-Applied_landscape_ecology_future_socioeconomics_and_policy_making_in_the_neotropics.pdf

## Strategic Goal C: Improve status of biodiversity by safeguarding ecosystems, species and genetic diversity

### *Target 12: Improve coverage and management of protected areas*

**Example**: Allnutt, T.F. et al., 2012. Comparison of Marine Spatial Planning Methods in Madagascar Demonstrates Value of Alternative Approaches R. K. F. Unsworth, ed. *PLoS ONE*, 7(2), p.e28969. Available at: http://dx.plos.org/10.1371/journal.pone.0028969

**Summary**: This paper aims to help the government of Madagascar to implement its plans to increase the coverage of marine protected areas off its coastline by more than one million hectares. It compares four different methods to select areas for protection based on fishing pressure, exposure to climate change and biodiversity. All results favour the creation of protected areas in parts of the northern, central and southern zones of the island's western coastal waters.

The calculation of biodiversity value is based on occurrence records for 274 fish species, published by the Ocean Biogeographic Information System (OBIS), and accessed using GBIF. The study's lead author, Tom Allnutt, comments: "GBIF was indispensible to the research."

One of the study's co-authors, Andry Rakotomanjaka of the Wildlife Conservation Society in Madagascar, has taken part in various GBIF workshops and training events.

## Strategic Goal D – enhance the benefits to all from biodiversity and ecosystem services

### *Target 14. Health and livelihoods*

Ferreres, F. et al., 2012. Bauhinia forficata Link authenticity using flavonoids profile: relation with their biological properties. *Food Chemistry*, online. Available at: http://linkinghub.elsevier.com/retrieve/pii/S0308814612004165

Hamid, A.A. & Aiyelaagbe, O.O., 2012. Pharmacological investigation of Asystasia calyciana for its antibacterial and antifungal properties. *International Journal of Chemical and Biochemical Sciences*, 1, p.99-104

Patiño, L.O.J., Prieto, R.J.A. & Cuca, S.L.E., 2012. Zanthoxylum Genus as Potential Source of Bioactive Compounds. In I. Rasooli, ed. *Bioactive Compounds in Phytomedicine*. InTech, p. 218. Available at: http://www.intechopen.com/source/pdfs/25790/InTech-Zanthoxylum_genus_as_potential_source_of_bioactive_compounds.pdf

## Strategic Goal E – enhancing implementation

### *Target 19. Improve the science base*

Andrew, M.E. et al., 2012. Beta-diversity gradients of butterflies along productivity axes. *Global Ecology and Biogeography*. Available at: http://doi.wiley.com/10.1111/j.1466-8238.2011.00676.x

Berndt, R., 2012. Species richness, taxonomy and peculiarities of the neotropical rust fungi: are they more diverse in the Neotropics? Biodiversity and Conservation. Available at: http://www.springerlink.com/index/10.1007/s10531-011-0220-z

Biffin, E. et al., 2012. Leaf evolution in Southern Hemisphere conifers tracks the angiosperm ecological radiation. *Proceedings of the Royal Society B: Biological Sciences*, online(June), p.341-348. Available at: http://www.ncbi.nlm.nih.gov/pubmed/21653584

Cadena, C.D. et al., in press. Latitude, elevational climatic zonation and speciation in New World vertebrates. *Proceedings of the Royal Society B: Biological Sciences*, 279(1726), p.194-201. Available at: http://www.ncbi.nlm.nih.gov/pubmed/21632626

Carpenter, R.J. et al., 2012. Near-tropical Early Eocene terrestrial temperatures at the Australo-Antarctic margin, western Tasmania. *Geology*, online(January). Available at: http://geology.gsapubs.org/cgi/doi/10.1130/G32584.1

Cires, E. & Prieto, J.A.F., 2012. The Iberian endemic species Ranunculus cabrerensis Rothm.: an intricate history in the Ranunculus parnassiifolius L. polyploid complex. *Plant Systematics and Evolution*, 298(1), p.121-138. Available at: http://www.springerlink.com/index/10.1007/s00606-011-0529-9

Demske, D., Tarasov, P.E. & Nakagawa, T., 2012. Atlas of pollen, spores and further non-pollen palynomorphs recorded in the glacial-interglacial late Quaternary sediments of Lake Suigetsu, central Japan. *Quaternary International*, online. Available at: http://linkinghub.elsevier.com/retrieve/pii/S1040618212000675

Doucet-Beaupré, H. et al., 2012. Pyganodon (Bivalvia: Unionoida: Unionidae) phylogenetics: A male- and female-transmitted mitochondrial DNA perspective. *Molecular Phylogenetics and Evolution*, online(February). Available at: http://www.ncbi.nlm.nih.gov/pubmed/22326838

Harikrishnan, S. et al., 2012. Phylogeography of Dasia Gray, 1830 (Reptilia: Scincidae), with the description of a new species from southern India. *Zootaxa*, 3233, p.37-51. Available at: http://www.mapress.com/zootaxa/2012/f/z03233p051f.pdf

Levsen, N.D., Tiffin, P. & Olson, M.S., 2012. Pleistocene Speciation in the Genus Populus (Salicaceae). *Systematic Biology*, online(785). Available at: http://www.ncbi.nlm.nih.gov/pubmed/22213709

Mayland-Quellhorst, E., Föller, J. & Wissemann, V., 2012. Biological Flora of the British Isles: Rosa spinosissima L. *Journal of Ecology*, 100(2), p.561-576. Available at: http://doi.wiley.com/10.1111/j.1365-2745.2011.01950.x

Meineri, E., Skarpaas, O. & Vandvik, V., 2012. Modeling alpine plant distributions at the landscape scale: Do biotic interactions matter? *Ecological Modelling*, 231, p.1-10. Available at: http://linkinghub.elsevier.com/retrieve/pii/S0304380012000506

Miller, J. & Rahmadi, C., 2012. A troglomorphic spider from Java (Araneae, Ctenidae, Amauropelma). *ZooKeys*, 163, p.1. Available at: http://www.pensoft.net/journals/zookeys/article/2265/abstract/a-troglomorphic-spider-from-java-araneae-ctenidae-amauropelma-

Nieukerken, E.J. van et al., 2012. DNA barcoding of the leaf-mining moth subgenus Ectoedemia s. str. (Lepidoptera : Nepticulidae) with COI and EF1-α: two are better than one in recognising cryptic species. *Contributions to Zoology*, 81(1), p.1-24. Available at: http://dpc.uba.uva.nl/cgi/t/text/get-pdf?idno=m8101a01;c=ctz

Pauwels, M. et al., 2012. Nuclear and chloroplast DNA phylogeography reveals vicariance among European populations of the model species for the study of metal tolerance, Arabidopsis halleri (Brassicaceae). *New Phytologist*. Available at: http://doi.wiley.com/10.1111/j.1469-8137.2011.04003.x

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Schmitt, E.M. & Glaubrecht, M., 2012. Revisiting the “Ralum Project”: Molluscs collected by Friedrich Dahl in 1896-1897 for the Museum of Natural History Berlin. *Zoosystematics and Evolution*, 88(1), p.79-95. Available at: http://doi.wiley.com/10.1002/zoos.201200009

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Virgilio, M. et al., 2012. Identifying insects with incomplete DNA barcode libraries, african fruit flies (Diptera: tephritidae) as a test case. *PloS one*, 7(2), p.e31581. Available at: http://www.ncbi.nlm.nih.gov/pubmed/22359600

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