

The Impact of Conservation on the Status of the World's Vertebrates

Michael Hoffmann,^{1,2*} Craig Hilton-Taylor,³ Ariadne Angulo,^{4,5} Monika Böhm,⁶ Thomas M. Brooks,^{7,8,9} Stuart H. M. Butchart,¹⁰ Kent E. Carpenter,^{2,5,11} Janice Chanson,^{5,12} Ben Collen,⁶ Neil A. Cox,^{5,13} William R. T. Darwall,³ Nicholas K. Dulvy,¹⁴ Lucy R. Harrison,¹⁴ Vineet Katariya,³ Caroline M. Pollock,³ Suhel Quader,¹⁵ Nadia I. Richman,⁶ Ana S. L. Rodrigues,¹⁶ Marcelo F. Tognelli,^{5,13,17} Jean-Christophe Vié,⁵ John M. Aguiar,¹⁸ David J. Allen,³ Gerald R. Allen,¹⁹ Giovanni Amori,²⁰ Natalia B. Ananjeva,²¹ Franco Andreone,²² Paul Andrew,²³ Aida Luz Aquino Ortiz,²⁴ Jonathan E. M. Baillie,²⁵ Ricardo Baldi,^{26,27} Ben D. Bell,²⁸ S. D. Biju,²⁹ Jeremy P. Bird,³⁰ Patricia Black-Decima,³¹ J. Julian Blanc,³² Federico Bolaños,³³ Wilmar Bolívar-G.,³⁴ Ian J. Burfield,¹⁰ James A. Burton,^{35,36} David R. Capper,³⁷ Fernando Castro,³⁸ Gianluca Catullo,³⁹ Rachel D. Cavanagh,⁴⁰ Alan Channing,⁴¹ Ning Labbish Chao,^{42,43,44} Anna M. Chenery,⁴⁵ Federica Chiozza,⁴⁶ Viola Clausnitzer,⁴⁷ Nigel J. Collar,¹⁰ Leah C. Collett,³ Bruce B. Collette,⁴⁸ Claudia F. Cortez Fernandez,⁴⁹ Matthew T. Craig,⁵⁰ Michael J. Crosby,¹⁰ Neil Cumberlidge,⁵¹ Annabelle Cuttelod,³ Andrew E. Derocher,⁵² Arvin C. Diesmos,⁵³ John S. Donaldson,⁵⁴ J. W. Duckworth,⁵⁵ Guy Dutson,⁵⁶ S. K. Dutta,⁵⁷ Richard H. Emslie,⁵⁸ Aljos Farjon,⁵⁹ Sarah Fowler,⁶⁰ Jörg Freyhof,⁶¹ David L. Garshelis,⁶² Justin Gerlach,⁶³ David J. Gower,⁶⁴ Tandora D. Grant,⁶⁵ Geoffrey A. Hammerson,⁶⁶ Richard B. Harris,⁶⁷ Lawrence R. Heaney,⁶⁸ S. Blair Hedges,⁶⁹ Jean-Marc Hero,⁷⁰ Baz Hughes,⁷¹ Syed Ainul Hussain,⁷² Javier Icochea M.,⁷³ Robert F. Inger,⁶⁸ Nobuo Ishii,⁷⁴ Djoko T. Iskandar,⁷⁵ Richard K. B. Jenkins,^{76,77,78} Yoshio Kaneko,⁷⁹ Maurice Kottelat,^{80,81} Kit M. Kovacs,⁸² Sergius L. Kuzmin,⁸³ Enrique La Marca,⁸⁴ John F. Lamoreux,^{5,85} Michael W. N. Lau,⁸⁶ Esteban O. Lavilla,⁸⁷ Kristin Leus,⁸⁸ Rebecca L. Lewison,⁸⁹ Gabriela Lichtenstein,⁹⁰ Suzanne R. Livingstone,⁹¹ Vimoksalehi Lukoschek,^{92,93} David P. Mallon,⁹⁴ Philip J. K. McGowan,⁹⁵ Anna McIvor,⁹⁶ Patricia D. Moehlman,⁹⁷ Sanjay Molur,⁹⁸ Antonio Muñoz Alonso,⁹⁹ John A. Musick,¹⁰⁰ Kristin Nowell,¹⁰¹ Ronald A. Nussbaum,¹⁰² Wanda Olech,¹⁰³ Nikolay L. Orlov,²¹ Theodore J. Papenfuss,¹⁰⁴ Gabriela Parra-Olea,¹⁰⁵ William F. Perrin,¹⁰⁶ Beth A. Polidoro,^{5,11} Mohammad Pourkazemi,¹⁰⁷ Paul A. Racey,¹⁰⁸ James S. Raggle,⁵ Mala Ram,⁶ Galen Rathbun,¹⁰⁹ Robert P. Reynolds,¹¹⁰ Anders G. J. Rhodin,¹¹¹ Stephen J. Richards,^{112,113} Lily O. Rodríguez,¹¹⁴ Santiago R. Ron,¹¹⁵ Carlo Rondinini,⁴⁶ Anthony B. Rylands,² Yvonne Sadovy de Mitcheson,^{116,117} Jonnell C. Sanciangco,^{5,11} Kate L. Sanders,¹¹⁸ Georgina Santos-Barrera,¹¹⁹ Jan Schipper,¹²⁰ Caryn Self-Sullivan,^{121,122} Yichuan Shi,³ Alan Shoemaker,¹²³ Frederick T. Short,¹²⁴ Claudio Sillero-Zubiri,¹²⁵ Débora L. Silvano,¹²⁶ Kevin G. Smith,³ Andrew T. Smith,¹²⁷ Jos Snoeks,^{128,129} Alison J. Stattersfield,¹⁰ Andrew J. Symes,¹⁰ Andrew B. Taber,¹³⁰ Bibhab K. Talukdar,¹³¹ Helen J. Temple,¹³² Rob Timmins,¹³³ Joseph A. Tobias,¹³⁴ Katerina Tsytulina,¹³⁵ Denis Tweddle,¹³⁶ Carmen Ubeda,¹³⁷ Sarah V. Valenti,⁶⁰ Peter Paul van Dijk,² Liza M. Veiga,^{138,139} Alberto Veloso,¹⁴⁰ David C. Wege,¹⁰ Mark Wilkinson,⁶⁴ Elizabeth A. Williamson,¹⁴¹ Feng Xie,¹⁴² Bruce E. Young,⁷ H. Resit Akçakaya,¹⁴³ Leon Bennun,¹⁰ Tim M. Blackburn,⁶ Luigi Boitani,⁴⁶ Holly T. Dublin,^{144,145} Gustavo A. B. da Fonseca,^{146,147} Claude Gascon,² Thomas E. Lacher Jr.,¹⁸ Georgina M. Mace,¹⁴⁸ Susan A. Mainka,¹⁴⁹ Jeffery A. McNeely,¹⁴⁹ Russell A. Mittermeier,^{2,149} Gordon McGregor Reid,¹⁵⁰ Jon Paul Rodriguez,¹⁵¹ Andrew A. Rosenberg,² Michael J. Samways,¹⁵² Jane Smart,¹⁴⁹ Bruce A. Stein,¹⁵³ Simon N. Stuart^{1,2,154,155}

Using data for 25,780 species categorized on the International Union for Conservation of Nature Red List, we present an assessment of the status of the world's vertebrates. One-fifth of species are classified as Threatened, and we show that this figure is increasing: On average, 52 species of mammals, birds, and amphibians move one category closer to extinction each year. However, this overall pattern conceals the impact of conservation successes, and we show that the rate of deterioration would have been at least one-fifth again as much in the absence of these. Nonetheless, current conservation efforts remain insufficient to offset the main drivers of biodiversity loss in these groups: agricultural expansion, logging, overexploitation, and invasive alien species.

In the past four decades, individual populations of many species have undergone declines and many habitats have suffered losses of

original cover (1, 2) through anthropogenic activity. These losses are manifested in species extinction rates that exceed normal background rates

by two to three orders of magnitude (3), with substantial detrimental societal and economic consequences (4). In response to this crisis, 193 parties to the Convention on Biological Diversity (CBD; adopted 1992) agreed "to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional, and national level as a contribution to poverty alleviation and to the benefit of all life on Earth" (5). That the target has not been met was borne out by empirical testing against 31 cross-disciplinary indicators developed within the CBD framework itself (1). However, this does not mean that conservation efforts have been ineffective. Conservation actions have helped to prevent extinctions (6, 7) and improve population trajectories (8), but there has been limited assessment of the overall impact of ongoing efforts in reducing losses in biodiversity (9, 10). Here, we assess the overall status of the world's vertebrates, determine temporal trajectories of extinction risk for three vertebrate classes, and estimate the degree to which conservation actions have reduced biodiversity loss.

Described vertebrates include 5498 mammals, 10,027 birds, 9084 reptiles, 6638 amphibians, and 31,327 fishes (table S1). Vertebrates are found at nearly all elevations and depths, occupy most major habitat types, and display remarkable variation in body size and life history. Although they constitute just 3% of known species, vertebrates play vital roles in ecosystems (11) and have great cultural importance (12). Under the auspices of the International Union for Conservation of Nature (IUCN) Species Survival Commission, we compiled data on the taxonomy, distribution, population trend, major threats, conservation measures, and threat status for 25,780 vertebrate species, including all mammals, birds, amphibians, cartilaginous fishes, and statistically

¹IUCN SSC Species Survival Commission, c/o United Nations Environment Programme World Conservation Monitoring Centre, 219 Huntingdon Road, Cambridge CB3 0DL, UK. ²Conservation International, 2011 Crystal Drive, Arlington, VA 22202, USA.

³Species Programme, IUCN, 219c Huntingdon Road, Cambridge CB3 ODL, UK. ⁴IUCN–CI Biodiversity Assessment Unit, c/o P.O. Box 19004, 360 A Bloor Street W., Toronto, Ontario M5S 1X1, Canada. ⁵Species Programme, IUCN, Rue Mauverney 28, 1196, Gland, Switzerland. ⁶Institute of Zoology, Zoological Society of London, Regent's Park, London NW1 4RY, UK. ⁷NatureServe, 1101 Wilson Boulevard, Arlington, VA 22209, USA. ⁸World Agroforestry Center (ICRAF), University of the Philippines Los Baños, Laguna 4031, Philippines. ⁹School of Geography and Environmental Studies, University of Tasmania, Hobart, Tasmania 7001, Australia. ¹⁰BirdLife International, Wellbrook Court, Girton Road, Cambridge CB3 0NA, UK. ¹¹Department of Biological Sciences, Old Dominion University, Norfolk, VA 23529, USA. ¹²IUCN–CI Biodiversity Assessment Unit, c/o 130 Weatherall Road, Cheltenham GL50 2QH, UK. ¹³IUCN–CI Biodiversity Assessment Unit, Conservation International, 2011 Crystal Drive Ste 500, Arlington, VA 22202, USA. ¹⁴IUCN Shark Specialist Group, Department of Biological Sciences, Simon Fraser University, Burnaby, British Columbia V5A 1S6, Canada.

¹⁵National Centre for Biological Sciences, Tata Institute of Fundamental Research, GKVK Campus, Bellary Road, Bangalore 560 065, India. ¹⁶Centre d'Ecologie Fonctionnelle et Evolutive, CNRS UMR5175, 1919 Route de Mende, 34293 Montpellier, France. ¹⁷Downloaded from www.sciencemag.org on December 9, 2010

- France. ¹⁷IADIZA-CONICET, CCT-Mendoza, CC 507, 5500 Mendoza, Argentina. ¹⁸Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX 77843, USA. ¹⁹Western Australian Museum, Locked Bag 49, Welshpool DC, Perth, Western Australia 6986, Australia. ²⁰CNR-Institute for Ecosystem Studies, Viale dell'Università 32, 00185 Rome, Italy. ²¹Zoological Institute, Russian Academy of Sciences, 199034 St. Petersburg, Universitetskaya nab.1, Russia. ²²Museo Regionale di Scienze Naturali, Via G. Giolitti, 36, I-10123 Torino, Italy. ²³Taronga Conservation Society Australia, Taronga Zoo, P.O. Box 20, Mosman 2088, Sydney, Australia. ²⁴Martin Barrios 2230 c/ Pizarro; Barrio Republicano, Asunción, Paraguay. ²⁵Zoological Society of London, Regent's Park, London, NW1 4RY, UK. ²⁶Unidad de Investigación Ecología Terrestre, Centro Nacional Patagónico-CONICET, Boulevard Brown 2915, 9120 Puerto Madryn, Argentina. ²⁷Patagonian and Andean Steppe Program, Wildlife Conservation Society, Boulevard Brown 2915, 9120 Puerto Madryn, Argentina. ²⁸Centre for Biodiversity & Restoration Ecology, School of Biological Sciences, Victoria University of Wellington, P.O. Box 600, Wellington 6140, New Zealand. ²⁹Systematics Lab, School of Environmental Studies, University of Delhi, Delhi 110 007, India. ³⁰Center for Biodiversity and Biosecurity Studies, Pacific Institute for Sustainable Development, Jalan Bumi Nyiur 101, Manado, North Sulawesi, Indonesia. ³¹Facultad de Ciencias Naturales e Instituto Miguel Lillo, Universidad Nacional de Tucumán, Miguel Lillo 205, 4000 SM de Tucumán, Tucumán, Argentina. ³²P.O. Box 47074, Nairobi 00100, Kenya. ³³Escuela de Biología, Universidad de Costa Rica, San Pedro, 11501-2060 San José, Costa Rica. ³⁴Sección de Zoología, Departamento de Biología, Facultad de Ciencias Naturales y Exactas, Universidad del Valle, Calle 13, No. 100-00, Cali, Colombia. ³⁵Earthwatch Institute, 256 Banbury Road, Oxford OX2 7DE, UK. ³⁶Veterinary Biomedical Sciences, Royal (Dick) School of Veterinary Studies, University of Edinburgh, Summerhall, Edinburgh EH9 1QH, Scotland, UK. ³⁷47B Lewisham Hill, London SE13 7PL, UK. ³⁸Laboratorio de Herpetología, Universidad del Valle, Carrera 51, No. 8H-15, Cali, Colombia. ³⁹WWF Italy—Species Office, Via Po 25/c 00198 Rome, Italy. ⁴⁰British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET, UK. ⁴¹Biodiversity and Conservation Biology Department, University of the Western Cape, Private Bag X17, Bellville 7535, South Africa. ⁴²Bio-Amazonia Conservation International, 1295 William Street, Baltimore, MD 21230, USA. ⁴³Universidade Federal do Amazonas, Depto Ciências Pesqueiras, Manaus, AM 60700, Brazil. ⁴⁴National Museum of Marine Biology and aquarium, 2 Houwan Road, Checheng, Pingtung 944, Taiwan, R.O.C. ⁴⁵United Nations Environment Programme World Conservation Monitoring Centre, 219 Huntingdon Road, Cambridge CB3 0DL, UK. ⁴⁶Department of Animal and Human Biology, Sapienza Università di Roma, Viale dell'Università 32, 00185 Roma, Italy. ⁴⁷Senckenberg Museum of Natural History Goerlitz, PF 300 154, 02806 Goerlitz, Germany. ⁴⁸National Marine Fisheries Service Systematics Laboratory, National Museum of Natural History, MRC-0153, Smithsonian Institution, Washington, DC 20013, USA. ⁴⁹Av. Busch, Edificio Girasoles 2, Piso 5, Depto 7, La Paz, Bolivia. ⁵⁰Department of Marine Sciences, University of Puerto Rico, P.O. Box 9000, Mayagüez, PR 00681, USA. ⁵¹Department of Biology, Northern Michigan University, Marquette, MI 49855, USA. ⁵²Department of Biological Sciences, University of Alberta, Edmonton, Alberta T6G 2E9, Canada. ⁵³Herpetology Section, Zoology Division, National Museum of the Philippines, Padre Burgos Avenue, Ermita 1000, Manila, Philippines. ⁵⁴South African National Biodiversity Institute, KRC, Private Bag X7, Claremont 7735, South Africa. ⁵⁵P.O. Box 5573, Vientiane, Lao PDR. ⁵⁶c/o Birds Australia, 60 Leicester Street, Carlton, Victoria 3053, Australia. ⁵⁷North Orissa University, Sriram Chandra Vihar, Takatpur, Baripada 757003, Dist: Mayurbhanj, Orissa, India. ⁵⁸IUCN SSC African Rhino Specialist Group, Box 1212, Hilton 3245, South Africa. ⁵⁹Herbarium, Library, Art & Archives, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, UK. ⁶⁰NatureBureau, 36 Kingfisher Court, Hambridge Road, Newbury RG14 5SJ, UK. ⁶¹Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Müggelseedamm 310, 12587 Berlin, Germany. ⁶²Minnesota Department of Natural Resources, Grand Rapids, MN 55744, USA. ⁶³Nature Protection Trust of Seychelles, 133 Cherry Hinton Road, Cambridge CB1 7BX, UK. ⁶⁴Department of Zoology, Natural History Museum, London SW7 5BD, UK. ⁶⁵San Diego Zoo Institute for Conservation Research, 15600 San Pasqual Valley Road, Escondido, CA 92027, USA. ⁶⁶NatureServe, 746 Middlepoint Road, Port Townsend, WA 98368, USA. ⁶⁷Department of Ecosystem and Conservation Science, University of Montana, Missoula, MT 59812, USA. ⁶⁸Field Museum of Natural History, Chicago, IL 60605, USA. ⁶⁹Department of Biology, Pennsylvania State University, University Park, PA 16802, USA. ⁷⁰Environmental Futures Centre, School of Environment, Griffith University, Gold Coast campus, Queensland, 4222, Australia. ⁷¹Wildfowl & Wetlands Trust, Slimbridge, Glos GL2 7BT, UK. ⁷²Wildlife Institute of India, Post Box #18, Dehra Dun, 248001 Uttarakhand, India. ⁷³Calle Arica 371, Dpto U-2, Miraflores, Lima 18, Perú. ⁷⁴School of Arts and Sciences, Tokyo Woman's Christian University, Zempukuji 2-6-1, Suginami-ku, Tokyo 167-8585, Japan. ⁷⁵School of Life Sciences and Technologi, Institut Teknologi Bandung, 10, Jalan Ganesa, Bandung 40132, Indonesia. ⁷⁶Durrell Institute of Conservation and Ecology, School of Anthropology and Conservation, University of Kent, Canterbury, Kent CT2 7NR, UK. ⁷⁷School of the Environment and Natural Resources, Bangor University, Bangor LL57 2UW, UK. ⁷⁸Madagasikara Voakajy, B.P. 5181, Antananarivo (101), Madagascar. ⁷⁹Iwate Prefectural University, Sugo 152-52, Takizawa, Iwate 020-0193, Japan. ⁸⁰Route de la Baroche 12, 2952 Cornol, Switzerland. ⁸¹Raffles Museum of Biodiversity Research, National University of Singapore, Department of Biological Sciences, 6 Science Drive 2, #03-01, 117546, Singapore. ⁸²Norwegian Polar Institute, 9296 Tromsø, Norway. ⁸³Institute of Ecology and Evolution, Russian Academy of Sciences, Leninsky Prospect, 33, Moscow 119071, Russia. ⁸⁴Laboratorio de Biogeografía, Escuela de Geografía, Universidad de Los Andes, Mérida 5101, Venezuela. ⁸⁵IUCN Species Programme, c/o 406 Randolph Hill Road, Randolph, NH 03593, USA. ⁸⁶Kadoorie Farm & Botanic Garden, Lam Kam Road, Tai Po, New Territories, Hong Kong SAR. ⁸⁷Instituto de Herpetología, Fundación Miguel Lillo-CONICET, Miguel Lillo 251, 4000 SM de Tucumán, Tucumán, Argentina. ⁸⁸Conservation Breeding Specialist Group—European Regional Office, p/a Annuntiatenstraat 6, 2170 Merksem, Belgium. ⁸⁹Biology Department, San Diego State University, San Diego, CA 92182, USA. ⁹⁰Instituto Nacional de Antropología y Pensamiento Latinoamericano, 3 de Febrero 1378, 1426 Buenos Aires, Argentina. ⁹¹Ecology and Evolutionary Biology, Faculty of Biomedical & Life Sciences, Graham Kerr Building, University of Glasgow, Glasgow G12 8QQ, Scotland, UK. ⁹²Department of Ecology and Evolutionary Biology, University of California, Irvine, CA 92697, USA. ⁹³ARC Centre of Excellence for Coral Reef Studies, James Cook University, Townsville, Queensland, 4811, Australia. ⁹⁴Department of Biology, Chemistry and Health Science, Manchester Metropolitan University, Manchester M1 5GD, UK. ⁹⁵World Pheasant Association, Newcastle University Biology Field Station, Close House Estate, Heddon on the Wall, Newcastle upon Tyne NE15 0HT, UK. ⁹⁶115 Suez Road, Cambridge CB1 3QD, UK. ⁹⁷Wildlife Trust Alliance, Box 2031, Arusha, Tanzania. ⁹⁸Zoo Outreach Organisation, 9A Lal Bahadur Colony, Peelamedu, Coimbatore, Tamil Nadu 641004, India. ⁹⁹El Colegio de la Frontera Sur, Apartado postal 63, Carretera Panamericana y Periférico sur s/n Col. María Auxiliadora, 29290, San Cristóbal de las Casas, Chiapas, México. ¹⁰⁰Virginia Institute of Marine Science, Gloucester Point, VA 23062, USA. ¹⁰¹CAT, P.O. Box 332, Cape Nedick, ME 03902, USA. ¹⁰²Division of Reptiles and Amphibians, Museum of Zoology, University of Michigan, Ann Arbor, MI 48109, USA. ¹⁰³Warsaw University of Life Sciences, Ciszewskiego 8, 02-786 Warsaw, Poland. ¹⁰⁴Museum of Vertebrate Zoology, University of California, Berkeley, CA 94720, USA. ¹⁰⁵Departamento de Zoología, Instituto de Biología, Universidad Nacional Autónoma de México, 04510 Ciudad Universitaria, México. ¹⁰⁶Southwest Fisheries Science Center, National Marine Fisheries Service, NOAA, 3333 North Torrey Pines Court, La Jolla, CA 92037, USA. ¹⁰⁷International Sturgeon Research Institute, P.O. Box 41635-3464, Rasht, Iran. ¹⁰⁸Centre for Ecology and Conservation, University of Exeter in Cornwall, Penryn TR10 9EZ, UK. ¹⁰⁹Department of Ornithology and Mammalogy, California Academy of Sciences (San Francisco), c/o P.O. Box 202, Cambria, CA 93428, USA. ¹¹⁰USGS Patuxent Wildlife Research Center, MRC 111, National Museum of Natural History, Smithsonian Institution, P.O. Box 37012, Washington, DC 20013, USA. ¹¹¹Chelonian Research Foundation, 168 Goodrich Street, Lunenburg, MA 01462, USA. ¹¹²Herpetology Department, South Australian Museum, North Terrace, Adelaide, South Australia 5000, Australia. ¹¹³Rapid Assessment Program, Conservation International, P.O. Box 1024, Atherton, Queensland 4883, Australia. ¹¹⁴German Technical Cooperation (GTZ) GmbH, Pasaje Bernardo Alcedo N° 150, piso 4, El Olivar, San Isidro, Lima 27, Perú. ¹¹⁵Museo de Zoológia, Escuela de Biología, Pontificia Universidad Católica del Ecuador, Av. 12 de Octubre y Veintimilla, Quito, Ecuador. ¹¹⁶School of Biological Sciences, University of Hong Kong, Pok Fu Lam Road, Hong Kong SAR. ¹¹⁷Society for the Conservation of Reef Fish Aggregations, 9888 Carroll Centre Road, Suite 102, San Diego, CA 92126, USA. ¹¹⁸School of Earth and Environmental Sciences, Darling Building, University of Adelaide, North Terrace, Adelaide 5005, Australia. ¹¹⁹Departamento de Biología Evolutiva, Facultad de Ciencias, Universidad Nacional Autónoma de México, Circuito Exterior S/N, 04510, Ciudad Universitaria, México. ¹²⁰Big Island Invasive Species Committee, Pacific Cooperative Studies Unit, University of Hawai'i, 23 East Kawili Street, Hilo, HI 96720, USA. ¹²¹Sirenia International, 200 Stonewall Drive, Fredericksburg, VA 22401, USA. ¹²²Department of Biology, P.O. Box 8042, Georgia Southern University, Statesboro, GA 30460, USA. ¹²³IUCN SSC Tapir Specialist Group, 330 Shareditch Road, Columbia, SC 29210, USA. ¹²⁴Department of Natural Resources and the Environment, University of New Hampshire, Jackson Estuarine Laboratory, Durham, NH 03824, USA. ¹²⁵Wildlife Conservation Research Unit, Department of Zoology, University of Oxford, Recanati-Kaplan Centre, Tubney House, Tubney OX13 5QL, UK. ¹²⁶Laboratório de Zoologia, Universidade Católica de Brasília, Campus I-Q.S. 07 Lote 01 EPCT-Taguatinga-DF, 71966-700, Brazil. ¹²⁷School of Life Sciences, Arizona State University, Tempe, AZ 85287, USA. ¹²⁸Royal Museum for Central Africa, Ichthyology, Leuvensesteenweg 13, B-3080 Tervuren, Belgium. ¹²⁹Katholieke Universiteit Leuven, Laboratory of Animal Diversity and Systematics, Charles Deberiotstraat 32, B-3000 Leuven, Belgium. ¹³⁰Center for International Forestry Research, Jalan CIFOR, Situ Gede, Bogor Barat 16115, Indonesia. ¹³¹Aaranyak and International Rhino Foundation, 50 Samanwoy Path (Survey), Post Office Beltola, Guwahati-781 028, Assam, India. ¹³²The Biodiversity Consultancy Ltd., 4 Woodend, Trumpington, Cambridge CB2 9LJ, UK. ¹³³2313 Willard Avenue, Madison, WI 53704, USA. ¹³⁴Edward Grey Institute, Department of Zoology, University of Oxford, Oxford OX1 3PS, UK. ¹³⁵Vertebrate Research Division, National Institute of Biological Resources, Environmental Research Complex, Gyeongseo-dong, Seo-gu, Incheon 404-708, South Korea. ¹³⁶South African Institute for Aquatic Biodiversity, P/Bag 1015, Grahamstown, 6140, South Africa. ¹³⁷Departamento de Zoología, Centro Regional Universitario Bariloche, Universidad Nacional del Comahue, Quintral 1250, 8400 Bariloche, Argentina. ¹³⁸Emilio Goeldi Museum, Av. Perimetral, 1901, Belém, Pará 66017-970, Brazil. ¹³⁹Federal University of Pará, Rua Augusto Corrêa, 01, Belém, Pará 66075-110, Brazil. ¹⁴⁰Departamento de Ciencias Ecológicas, Facultad de Ciencias, Universidad de Chile, Las Palmeras 3425, Casilla 6553, Santiago, Chile. ¹⁴¹Department of Psychology, University of Stirling, Stirling FK9 4LA, Scotland, UK. ¹⁴²Chengdu Institute of Biology, the Chinese Academy of Sciences, Chengdu, 610041, P.R. China. ¹⁴³Department of Ecology and Evolution, Stony Brook University, Stony Brook, NY 11794, USA. ¹⁴⁴IUCN SSC, African Elephant Specialist Group, c/o IUCN ESARO, P.O. Box 68200, Nairobi 00200, Kenya. ¹⁴⁵Wildlife Conservation Society, 2300 Southern Boulevard, Bronx, NY 10460, USA. ¹⁴⁶Global Environment Facility, 1818 H Street NW, G 6-602, Washington, DC 20433, USA. ¹⁴⁷Department of Zoology, Federal University of Minas Gerais, 31270-901, Belo Horizonte, Brazil. ¹⁴⁸Centre for Population Biology, Imperial College London, Silwood Park, Ascot, Berks SL5 7PY, UK. ¹⁴⁹IUCN, 28 Rue Mauverney, CH-1196 Gland, Switzerland. ¹⁵⁰North of England Zoological Society, Chester Zoo, Upton-by-Chester, Chester CH2 1LH, UK. ¹⁵¹Centro de Ecología, Instituto Venezolano de Investigaciones Científicas, Apartado 20632, Caracas 1020-A, Venezuela, and Provia, Apartado 47552, Caracas 1041-A, Venezuela. ¹⁵²Department of Conservation Ecology and Entomology, Stellenbosch University, P/Bag X1, Matieland 7602, South Africa. ¹⁵³National Wildlife Federation, 901 E Street NW, Suite 400, Washington, DC 20004, USA. ¹⁵⁴Department of Biology and Biochemistry, University of Bath, Bath BA2 7AY, UK. ¹⁵⁵Al Ain Wildlife Park & Resort, P.O. Box 45553, Abu Dhabi, United Arab Emirates.

*To whom correspondence should be addressed. E-mail: mike.hoffmann@iucn.org

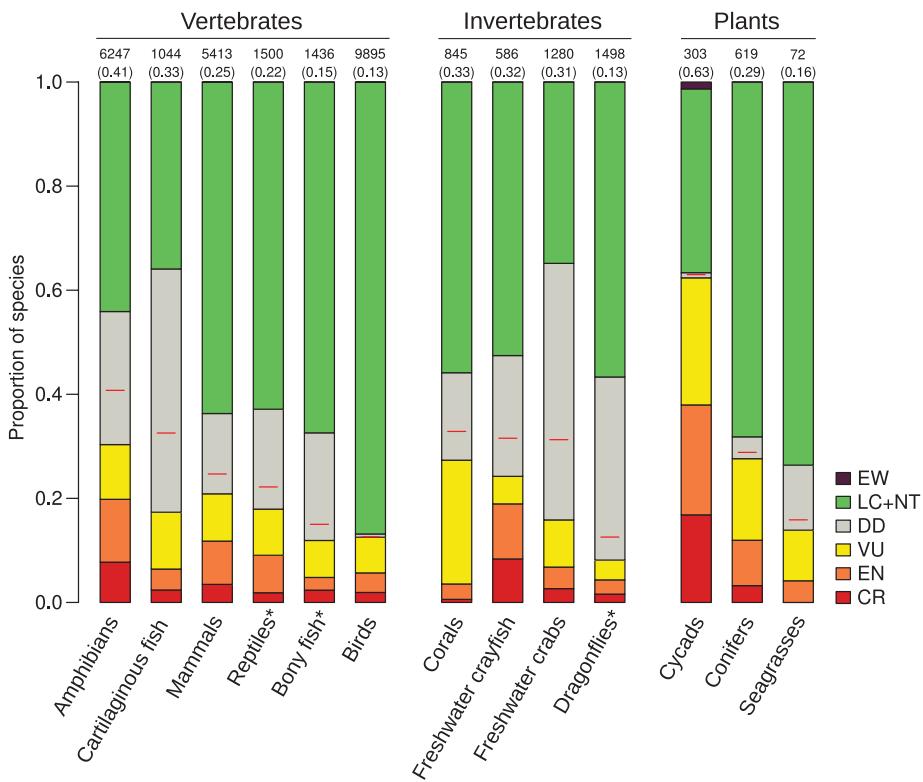


Fig. 1. The proportion of vertebrate species in different Red List categories compared with completely (or representatively) assessed invertebrate and plant taxa on the 2010 IUCN Red List (15). EW, Extinct in the Wild; CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern; DD, Data Deficient. Extinct species are excluded. Taxa are ordered according to the estimated percentage (shown by horizontal red lines and given in parentheses at tops of bars) of extant species considered Threatened if Data Deficient species are Threatened in the same proportion as data-sufficient species. Numbers above the bars represent numbers of extant species assessed in the group; asterisks indicate those groups in which estimates are derived from a randomized sampling approach.

representative samples of reptiles and bony fishes [~ 1500 species each (13)].

The IUCN Red List is the widely accepted standard for assessing species' global risk of extinction according to established quantitative criteria (14). Species are categorized in one of eight categories of extinction risk, with those in the categories Critically Endangered, Endangered, or Vulnerable classified as Threatened. Assessments are designed to be transparent, objective, and consultative, increasingly facilitated through workshops and Web-based open-access systems. All data are made freely available for consultation (15) and can therefore be challenged and improved upon as part of an iterative process toward ensuring repeatable assessments over time.

Status, trends, and threats. Almost one-fifth of extant vertebrate species are classified as Threatened, ranging from 13% of birds to 41% of amphibians, which is broadly comparable with the range observed in the few invertebrate and plant taxa completely or representatively assessed to date (Fig. 1 and table S2). When we incorporate the uncertainty that Data Deficient species (those with insufficient information for determining risk of extinction) introduce, the proportion of all vertebrate species classified as Threatened is between 16% and 33% (midpoint = 19%; table S3). [Further details of the data and assumptions behind these values are provided in (16) and tables S2 and S3.] Threatened vertebrates occur mainly in tropical regions (Fig. 2), and these concentrations are generally disproportionately high even when accounting for their high overall species

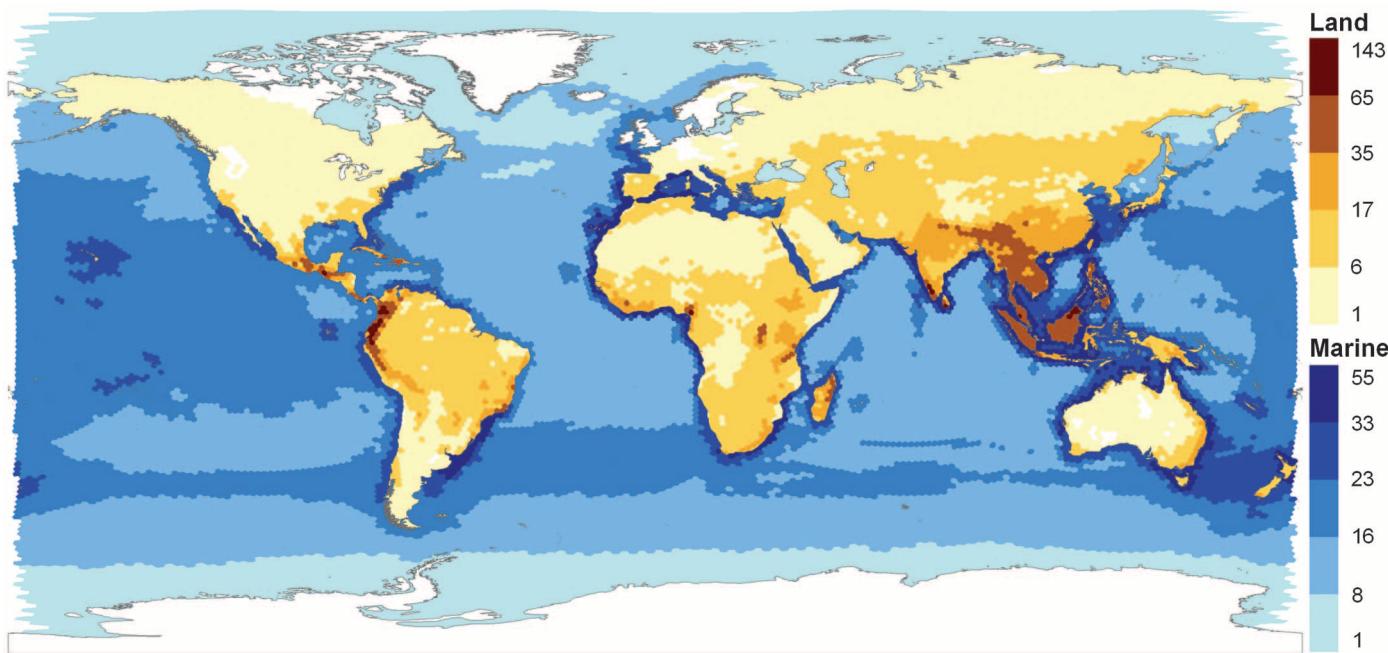


Fig. 2. Global patterns of threat, for land (terrestrial and freshwater, in brown) and marine (in blue) vertebrates, based on the number of globally Threatened species in total.

richness (fig. S4, A and B). These patterns highlight regions where large numbers of species with restricted distributions (17) coincide

with intensive direct and indirect anthropogenic pressures, such as deforestation (18) and fisheries (19).

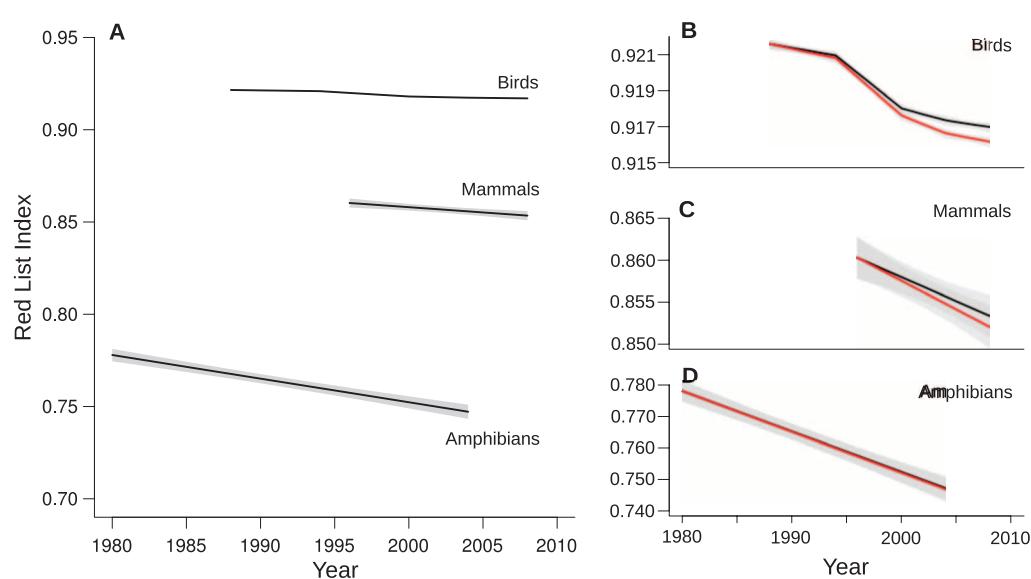
To investigate temporal trends in extinction risk of vertebrates, we used the IUCN Red List Index (RLI) methodology (20) that has been

Table 1. Net number of species qualifying for revised IUCN Red List categories between assessments owing to genuine improvement or deterioration in status, for birds (1988 to 2008), mammals (1996 to 2008), and amphibians (1980 to 2004). Category abbreviations are as for Fig. 1; CR(PE/PEW) denotes Critically Endangered (Possibly Extinct or Possibly Extinct in the Wild). CR excludes PE/PEW. Species undergoing an improvement (i.e., moving from a higher to a lower category of threat) are indicated by "+"; species de-

teriorating in status (i.e., moving from a lower to a higher category of threat) are indicated by "-". Species changing categories for nongenuine reasons, such as improved knowledge or revised taxonomy, are excluded. In the case of birds, for which multiple assessments have been undertaken, values in parentheses correspond to the sum of all changes between consecutive assessments; the same species may therefore contribute to the table more than once [see (16)].

		Red List category at end of period							
		CR		CR (PE/PEW)	CR	EN	VU	NT	LC
		EX	EW						
Birds	EX	0	0	0	0	0	0	0	0
	EW	0	0	0	+1 (+1)	0	0	0	0
	CR (PE/PEW)	0	0	0	0	0	0	0	0
	CR	-2 (-2)	-2 (-2)	-7 (-7)	-22 (-27)	+16 (+19)	+1 (+3)	0	0
	EN	0	0	0	-10 (-11)	-34 (-41)	+4 (+5)	0	0
	VU	0	0	0	-4 (-4)	-5 (-2)	-40 (-47)	+9 (+10)	0 (+1)
	NT	0	0	0	-1 (0)	-5 (-4)	-5 (-5)	-78 (-81)	+1 (+1)
	LC	0	0	0	-1 (0)	-5 (-4)	-5 (-5)	-78 (-81)	+1 (+1)
	Mammals	EX	0	0	0	0	0	0	0
	EW	0	0	0	+1	+1	0	0	0
Red List category at start of period	CR (PE/PEW)	0	0	0	0	0	0	0	0
	CR	0	-1	-3	-31	+3	+2	0	0
	EN	0	0	0	-2	-39	+3	+1	0
	VU	0	0	0	-1	-4	-47	+5	+1
	NT	0	0	0	-1	-4	-47	+7	+7
	LC	0	0	0	0	-2	-2	-39	-39
	Amphibians	EX	0	0	0	0	0	0	0
	EW	0	0	0	0	0	0	0	0
	CR (PE/PEW)	-2	0	0	0	0	0	0	0
	CR	-3	-1	-34	0	+2	0	0	0
	EN	-2	0	-42	-77	0	+2	0	0
	VU	-2	0	-19	-51	-45	0	+2	0
	NT	0	0	0	-7	-18	-32	0	0
	LC	0	0	0	-3	-8	-20	-92	-92

Fig. 3. (A) Trends in the Red List Index (RLI) for the world's birds, mammals, and amphibians. **(B to D)** Observed change in the RLI for each group (black) compared with RLI trends that would be expected if species that underwent an improvement in status due to conservation action had undergone no change (red). The difference is attributable to conservation. An RLI value of 1 equates to all species being Least Concern; an RLI value of 0 equates to all species being Extinct. Improvements in species conservation status lead to increases in the RLI; deteriorations lead to declines. A downward trend in the RLI value means that the net expected rate of species extinctions is increasing. Shading shows 95% confidence intervals. Note: RLI scales for (B), (C), and (D) vary.



adopted for reporting against global targets (1, 2). We calculated the change in RLI for birds (1988, 1994, 2000, 2004, and 2008), mammals (1996 and 2008), and amphibians (1980 and 2004); global trend data are not yet available for other vertebrate groups, although regional indices have been developed (21). The RLI methodology is explained in detail in (16), but in summary the index is an aggregated measure of extinction risk calculated from the Red List categories of all assessed species in a taxon, excluding Data Deficient species. Changes in the RLI over time result from species changing categories between assessments (Table 1). Only real improvements or deteriorations in status (termed “genuine” changes) are considered; recategorizations attributable to improved knowledge, taxonomy, or criteria change (“nongenuine” changes) are excluded (22). Accordingly, the RLI is calculated only after earlier Red List categorizations are retrospectively corrected using current information and taxonomy, to ensure that the same species are considered throughout and that only genuine changes are included. For example, the greater red musk shrew (*Crocidura flavescens*) was classified as Vulnerable in 1996 and as Least Concern in 2008; however, current evidence indicates that the species was also Least Concern in 1996, and the apparent improvement is therefore a nongenuine change. In contrast, Hose’s broadbill (*Calyptomena hosii*)

was one of 72 bird species to deteriorate one Red List category between 1994 and 2000, from Least Concern to Near Threatened, mainly because of accelerating habitat loss in the Sundaic lowlands in the 1990s. Such a deterioration in a species’ conservation status leads to a decline in the RLI (corresponding to increased aggregated extinction risk); an improvement would lead to an increase in the RLI.

Temporal trajectories reveal declining RLIs for all three taxa. Among birds, the RLI (Fig. 3A) showed that their status deteriorated from 1988 to 2008, with index values declining by 0.49%, an average of 0.02% per year (table S4). For mammals, the RLI declined by 0.8% from 1996 to 2008, a faster rate (0.07% per year) than for birds. Proportionally, amphibians were more threatened than either birds or mammals; RLI values declined 3.4% from 1980 to 2004 (0.14% per year). Although the absolute and proportional declines in RLIs for each taxonomic group were small, these represent considerable biodiversity losses. For example, the deterioration for amphibians was equivalent to 662 amphibian species each moving one Red List category closer to extinction over the assessment period. The deteriorations for birds and mammals equate to 223 and 156 species, respectively, deteriorating at least one category. On average, 52 species per year moved one Red List category closer to extinction from 1980 to

2008. Note that the RLI does not reflect ongoing population changes that are occurring too slowly to trigger change to different categories of threat. Other indicators based on vertebrate population sizes showed declines of 30% between 1970 and 2007 (1, 2, 22).

Global patterns of increase in overall extinction risk are most marked in Southeast Asia (Fig. 4 and figs. S5A and S6). It is known that the planting of perennial export crops (such as oil palm), commercial hardwood timber operations, agricultural conversion to rice paddies, and unsustainable hunting have been detrimental to species in the region (23), but here we show the accelerating rate at which these forces are driving change. In California, Central America, the tropical Andean regions of South America, and Australia, patterns have been driven mainly by the “enigmatic” deteriorations among amphibians (24), which have increasingly been linked to the infectious disease chytridiomycosis, caused by the presumed invasive fungal pathogen *Batrachochytrium dendrobatidis* (25). Almost 40 amphibians have deteriorated in status by three or more IUCN Red List categories between 1980 and 2004 (Table 1).

Although chytridiomycosis has been perhaps the most virulent threat affecting vertebrates to emerge in recent years, it is not the only novel cause of rapid declines. The toxic effects of the veterinary drug diclofenac on Asian vultures have

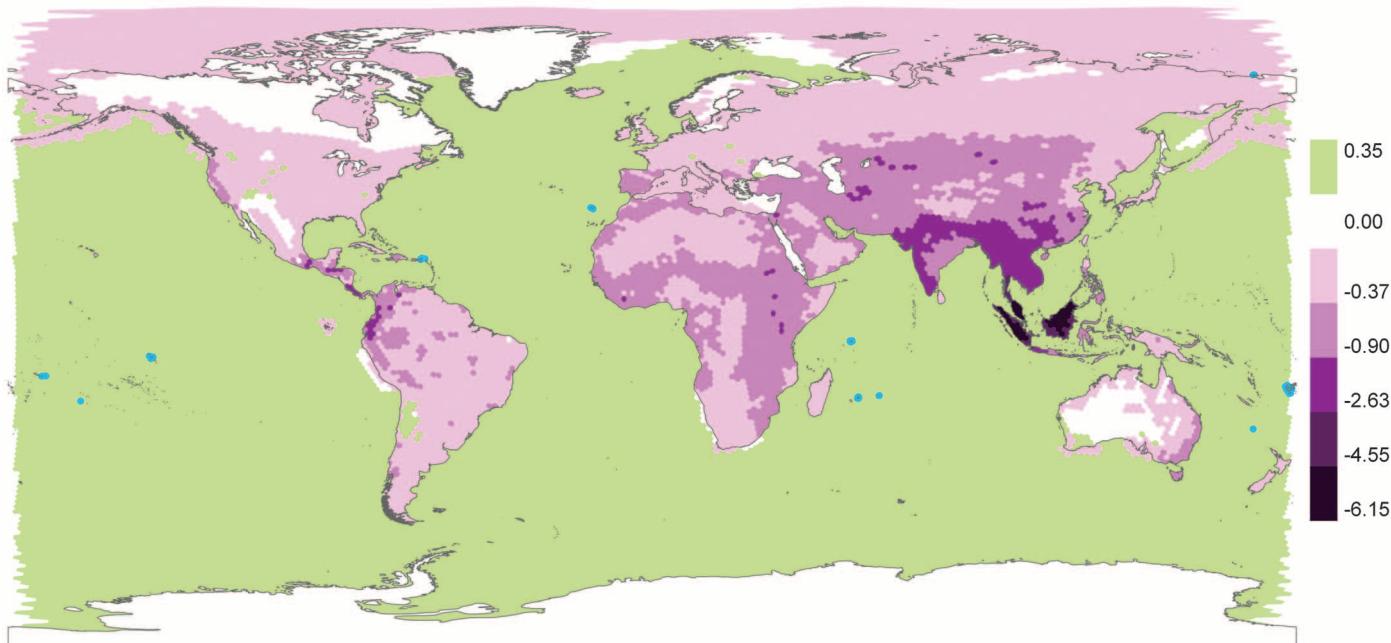


Fig. 4. Global patterns of net change in overall extinction risk across birds, mammals, and amphibians (for the periods plotted in Fig. 3) mapped as average number of genuine Red List category changes per cell per year. Purple corresponds to net deterioration (i.e., net increase in extinction risk) in that cell; green, net improvement (i.e., decrease in extinction risk); white, no change. The uniform pattern of improvement at sea is driven by improvements of migratory marine mammals with

cosmopolitan distributions (e.g., the humpback whale). Deteriorations on islands [e.g., the nightingale reed-warbler (*Acrocephalus luscinius*) in the Northern Mariana Islands] and improvements on islands [e.g., the Rarotonga monarch (*Pomarea dimidiata*) in the Cook Islands] are hard to discern; islands showing overall net improvements are shown in blue. Note that the intensity of improvements never matches the intensity of deteriorations.

caused estimated population declines exceeding 99% over the past two decades in certain *Gyps* species, and have resulted in three species moving from Near Threatened to Critically Endangered between 1994 and 2000. Numbers of Tasmanian devils (*Sarcophilus harrisii*) have fallen by more than 60% in the past 10 years because of the emergence of devil facial tumor disease (resulting in three step changes from Least Concern to Endangered). Climate change is not yet adequately captured by the IUCN Red List (26, 27) but has been directly implicated in the deteriorating status of several vertebrates and may interact with other threats to hasten extinction (28). However, there is no evidence of a parallel to the systemwide deteriorations documented for reef-building corals affected by bleaching events related to El Niño–Southern Oscillation occurrences (29).

Most deteriorations in status are reversible, but in 13% of cases they have resulted in extinction. Two bird species—the kamao (*Myadestes myadestinus*) from Hawaii and the Alaotra grebe (*Tachybaptus rufolavatus*) from Madagascar—became extinct between 1988 and 2008, and a further six Critically Endangered species have been flagged as “possibly extinct” during this period (Table 1 and table S5). At least nine amphibian species vanished during the two decades after 1980, including the golden toad (*Incilius periglenes*) from Costa Rica and both of Australia’s unique gastric-brooding frog species (genus *Rheobatrachus*); a further 95 became possibly extinct, 18 of them harlequin toads in the Neotropical genus *Atelopus* (23% of species). No mammals are listed as Extinct for the period 1996 to 2008, although the possible extinction of the Yangtze River dolphin (*Lipotes vexillifer*) would be the first megafauna vertebrate species extinction since the Caribbean monk seal in the 1950s (30).

Estimates of conservation success. These results support previous findings that the state of biodiversity continues to decline, despite increasing trends in responses such as protected areas coverage and adoption of national legislation (1, 2). Next, we asked whether conservation efforts have made any measurable contribution to reducing declines or improving the status of biodiversity.

The RLI trends reported here are derived from 928 cases of recategorization on the IUCN Red List (Table 1 and table S6), but not all of these refer to deteriorations. In 7% of cases (68/928), species underwent an improvement in status, all but four due to conservation action. For example, the Asian crested ibis (*Nipponia nippon*) changed from Critically Endangered in 1994 to Endangered in 2000 owing to protection of nesting trees, control of agrochemicals in rice fields, and prohibition of firearms; the four exceptions were improvements resulting from natural processes, such as unassisted habitat regeneration (tables S7 and S8). Nearly all of these improvements involved mammals

and birds, where the history of conservation extends farther back and where the bulk of species-focused conservation funding and attention is directed (31). Only four amphibian species underwent improvements, because the amphibian extinction crisis is such a new phenomenon and a plan for action has only recently been developed (32).

To estimate the impact of conservation successes, we compared the observed changes in the RLI with the RLI trends expected if all 64 species that underwent an improvement in status due to conservation action had not done so (16). Our explicit assumption is that in the absence of conservation, these species would have remained unchanged in their original category, although we note that this approach is conservative because it is likely that some would have deteriorated [in the sense of (6)]. The resulting difference between the two RLIs can be attributed to conservation. We show that the index would have declined by an additional 18% for both birds and mammals in the absence of conservation (Fig. 3, B and C, and table S4). There was little difference for amphibians (+1.4%; Fig. 3D) given the paucity of species improvements. For birds, conservation action reduced the decline in the RLI from 0.58% to 0.49%, equivalent to preventing 39 species each moving one Red List category closer to extinction between 1988 and 2008. For mammals, conservation action reduced the RLI decline from 0.94% to 0.8%, equivalent to preventing 29 species moving one category closer to extinction between 1996 and 2008.

These results grossly underestimate the impact of conservation, because they do not account for species that either (i) would have deteriorated further in the absence of conservation actions, or (ii) improved numerically, although not enough to change Red List status. As an example among the former, the black stilt (*Himantopus novaezelandiae*) would have gone extinct were it not for reintroduction and predator control efforts, and its Critically Endangered listing has thus remained unchanged (6). Among the latter, conservation efforts improved the total population numbers of 33 Critically Endangered birds during the period 1994 to 2004, but not sufficiently for any species to be moved to a lower category of threat (33). As many as 9% of mammals, birds, and amphibians classified as Threatened or Near Threatened have stable or increasing populations (15) largely due to conservation efforts, but it will take time for these successes to translate into improvements in status. Conservation efforts have also helped to avoid the deterioration in status of Least Concern species. Finally, conservation actions have benefited many other Threatened species besides birds, mammals, and amphibians, but this cannot yet be quantified through the RLI for groups that have been assessed only once [e.g., salmon shark (*Lamna ditropis*) numbers have improved as the result

of a 1992 U.N. moratorium on large-scale pelagic driftnet fisheries].

Confronting threats. Species recovery is complex and case-specific, but threat mitigation is always required. We investigated the main drivers of increased extinction risk by identifying, for each species that deteriorated in status, the primary threat responsible for that change. To understand which drivers of increased extinction risk are being mitigated most successfully, we identified, for each species that improved in status, the primary threat offset by successful conservation (table S6).

We found that for any single threat, regardless of the taxa involved, deteriorations outnumber improvements; conservation actions have not yet succeeded in offsetting any major driver of increased extinction risk (fig. S7). On a per-species basis, amphibians are in an especially dire situation, suffering the double jeopardy of exceptionally high levels of threat coupled with low levels of conservation effort. Still, there are conservation successes among birds and mammals, and here we investigate the degree to which particular threats have been addressed.

Conservation actions have been relatively successful at offsetting the threat of invasive alien species for birds and mammals: For every five species that deteriorated in status because of this threat, two improved through its mitigation. These successes have resulted from the implementation of targeted control or eradication programs [e.g., introduced cats have been eradicated from 37 islands since the mid-1980s (34) coupled with reintroduction initiatives [e.g., the Seychelles magpie-robin (*Copsychus sechellarum*) population was 12 to 15 birds in 1965 but had increased to 150 birds by 2005 (fig. S8)]. Many of these improvements have occurred on small islands but also in Australia, owing in part to control of the red fox (*Vulpes vulpes*) (Fig. 4 and fig. S5B). However, among amphibians, only a single species—the Mallorcan midwife toad (*Alytes muletensis*)—improved in status as a result of mitigation of the threat posed by invasive alien species, compared with 208 species that deteriorated. This is because there is still a lack of understanding of the pathways by which chytridiomycosis is spread and may be controlled, and in situ conservation management options are only just beginning to be identified [e.g., (35)]. Meanwhile, the establishment of select, targeted captive populations with the goal of reintroducing species in the wild may offer valuable opportunities once impacts in their native habitat are brought under control [e.g., the Kihansi spray toad (*Nectophrynoides asperginis*), categorized as Extinct in the Wild because of drastic alteration of its spray zone habitat].

For mammals and birds, the threats leading to habitat loss have been less effectively addressed relative to that of invasive alien species: For every 10 species deteriorating as a

result of agricultural expansion, fewer than 1 improved because of mitigation of this threat. Protected areas are an essential tool to safeguard biodiversity from habitat loss, but the protected areas network remains incomplete and nonstrategic relative to Threatened species (17), and reserve management can be ineffective (36). Numerous Threatened species are restricted to single sites, many still unprotected (37), and these present key opportunities to slow rates of extinction. In the broader matrix of unprotected land, agri-environmental schemes could offer important biodiversity benefits, provided that management policies are sufficient to enhance populations of Threatened species (38).

Hunting has been relatively poorly addressed in mammals (62 deteriorations, 6 improvements) when compared with birds (31 deteriorations, 9 improvements). In birds, successes have resulted mainly from targeted protection [e.g., Lear's macaw (*Anodorhynchus leari*) changed from Critically Endangered to Endangered as a result of active protection of the Toca Velha/Serra Branca cliffs in Brazil], but also from enforcement of legislation (e.g., hunting bans) and harvest management measures. Many mammals subject to hunting occur at low densities, have large home ranges, and/or are large-bodied. Although active site-based protection has contributed to an improvement in the status of some of these species, site protection alone is often insufficient if not complemented by appropriate legislation, biological management, and effective enforcement (39). For example, a combination of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) and enactment of the Vicuña Convention, which prohibited domestic exploitation and mandated the establishment of protected areas, has helped to improve the status of the vicuña (*Vicugna vicugna*) from Near Threatened to Least Concern.

The threat of fisheries has been mitigated relatively more effectively for marine mammals (4 deteriorations, 2 improvements) than for birds (10 deteriorations, 0 improvements), reflecting both the time when drivers first emerged and the past influence of supranational conservation policy. Among historically exploited, long-lived mammals, for example, the humpback whale (*Megaptera novaeangliae*) has benefited from protection from commercial whaling (since 1955) and has improved from Vulnerable to Least Concern. Declines among slow-breeding seabirds (particularly albatrosses and petrels; fig. S9) are mainly a consequence of increasing incidental by-catch resulting from the growth of commercial fisheries, primarily those that use long-line and trawling methods. Legislative tools, such as the recently enacted multilateral Agreement on the Conservation of Albatrosses and Petrels (40), may yet deliver dividends by coordinating international action to reduce fisheries mortality of these highly migratory species.

Binding legislation and harvest management strategies also are urgently needed to address the disproportionate impact of fisheries on cartilaginous fishes (fig. S10).

We have no data on the relationship between expenditure on biodiversity and conservation success. A disproportionate percentage of annual conservation funding is spent in economically wealthy countries (41), where there are generally fewer Threatened species (Fig. 2 and fig. S4B) and the disparity between success and failure appears less evident (Fig. 4). Southeast Asia, by contrast, has the greatest imbalance between improving and deteriorating trends, emphasizing the need there for greater investment of resources and effort.

Conclusions. Our study confirms previous reports of continued biodiversity losses. We also find evidence of notable conservation successes illustrating that targeted, strategic conservation action can reduce the rate of loss relative to that anticipated without such efforts. Nonetheless, the current level of action is outweighed by the magnitude of threat, and conservation responses will need to be substantially scaled up to combat the extinction crisis. Even with recoveries, many species remain conservation-dependent, requiring sustained, long-term investment (42); for example, actions have been under way for 30 years for the golden lion tamarin (*Leontopithecus rosalia*), 70 years for the whooping crane (*Grus americana*), and 115 years for the white rhinoceros (*Ceratotherium simum*).

Halting biodiversity loss will require coordinated efforts to safeguard and effectively manage critical sites, complemented by broad-scale action to minimize further destruction, degradation, and fragmentation of habitats (37, 39) and to promote sustainable use of productive lands and waters in a way that is supportive to biodiversity. Effective implementation and enforcement of appropriate legislation could deliver quick successes; for example, by-catch mitigation measures, shark-finning bans, and meaningful catch limits have considerable potential to reduce declines in marine species (19). The 2010 biodiversity target may not have been met, but conservation efforts have not been a failure. The challenge is to remedy the current shortfall in conservation action to halt the attrition of global biodiversity.

References and Notes

1. S. H. M. Butchart *et al.*, *Science* **328**, 1164 (2010); 10.1126/science.1187512.
2. Secretariat of the Convention on Biological Diversity, *Global Biodiversity Outlook 3* (Convention on Biological Diversity, Montréal, 2010).
3. S. L. Pimm, G. J. Russell, J. L. Gittleman, T. M. Brooks, *Science* **269**, 347 (1995).
4. TEEB, *The Economics and Ecosystems of Biodiversity: An Interim Report* (European Communities, Cambridge, 2008).
5. UNEP, Report of the Sixth Meeting of the Conference of the Parties to the Convention on Biological Diversity (UNEP/CBD/COP/20/Part 2) Strategic Plan Decision VI/26 in CBD (UNEP, Nairobi, 2002); www.cbd.int/doc/meetings/cop/cop-06/official/cop-06-20-en.pdf.
6. S. H. M. Butchart, A. J. Stattersfield, N. J. Collar, *Oryx* **40**, 266 (2006).
7. A. S. L. Rodrigues, *Science* **313**, 1051 (2006).
8. P. F. Donald *et al.*, *Science* **317**, 810 (2007).
9. T. M. Brooks, S. J. Wright, D. Sheil, *Conserv. Biol.* **23**, 1448 (2009).
10. P. J. Ferraro, S. K. Pattanayak, *PLoS Biol.* **4**, e105 (2006).
11. J. W. Terborgh, *Conserv. Biol.* **2**, 402 (1988).
12. B. Clucas, K. Mchugh, T. Caro, *Biodivers. Conserv.* **17**, 1517 (2008).
13. J. E. M. Baillie *et al.*, *Cons. Lett.* **1**, 18 (2008).
14. G. M. Mace *et al.*, *Conserv. Biol.* **22**, 1424 (2008).
15. IUCN Red List of Threatened Species. Version 2010.3 (IUCN, 2010; www.iucnredlist.org).
16. See supporting material on *Science* Online.
17. A. S. L. Rodrigues *et al.*, *Bioscience* **54**, 1092 (2004).
18. M. C. Hansen *et al.*, *Proc. Natl. Acad. Sci. U.S.A.* **105**, 9439 (2008).
19. B. Worm *et al.*, *Science* **325**, 578 (2009).
20. S. H. M. Butchart *et al.*, *PLoS One* **2**, e140 (2007).
21. N. K. Dulvy, S. Jennings, S. I. Rogers, D. L. Maxwell, *Can. J. Fish. Aquat. Sci.* **63**, 1267 (2006).
22. B. Collen *et al.*, *Conserv. Biol.* **23**, 317 (2009).
23. N. S. Sodhi, L. P. Koh, B. W. Brook, P. K. Ng, *Trends Ecol. Evol.* **19**, 654 (2004).
24. S. N. Stuart *et al.*, *Science* **306**, 1783 (2004); 10.1126/science.1103538.
25. D. B. Wake, V. T. Vredenburg, *Proc. Natl. Acad. Sci. U.S.A.* **105** (suppl. 1), 11466 (2008).
26. H. R. Akçakaya, S. H. M. Butchart, G. M. Mace, S. N. Stuart, C. Hilton-Taylor, *Glob. Change Biol.* **12**, 2037 (2006).
27. B. W. Brook *et al.*, *Biol. Lett.* **5**, 723 (2009).
28. W. F. Laurance, D. C. Ueche, *Conserv. Biol.* **23**, 1427 (2009).
29. K. E. Carpenter *et al.*, *Science* **321**, 560 (2008); 10.1126/science.1159196.
30. S. T. Turvey *et al.*, *Biol. Lett.* **3**, 537 (2007).
31. N. Sitas, J. E. M. Baillie, N. J. B. Isaac, *Anim. Conserv.* **12**, 231 (2009).
32. C. Gascon *et al.*, Eds., *Amphibian Conservation Action Plan* (IUCN/SSC Amphibian Specialist Group, Gland, Switzerland, 2007).
33. M. de L. Brooke *et al.*, *Conserv. Biol.* **22**, 417 (2008).
34. M. Nogales *et al.*, *Conserv. Biol.* **18**, 310 (2004).
35. R. N. Harris *et al.*, *ISME J.* **3**, 818 (2009).
36. L. M. Curran *et al.*, *Science* **303**, 1000 (2004).
37. T. H. Ricketts *et al.*, *Proc. Natl. Acad. Sci. U.S.A.* **102**, 18497 (2005).
38. D. Kleijn *et al.*, *Ecol. Lett.* **9**, 243 (2006).
39. C. Boyd *et al.*, *Cons. Lett.* **1**, 37 (2008).
40. J. Cooper *et al.*, *Mar. Ornithol.* **34**, 1 (2006).
41. A. N. James, K. J. Gaston, A. Balmford, *Nature* **401**, 323 (1999).
42. J. M. Scott, D. D. Goble, A. M. Haines, J. A. Wiens, M. C. Neel, *Cons. Lett.* **3**, 91 (2010).
43. We are indebted to the more than 3000 species experts who devoted their knowledge, intellect, and time to the compilation of vertebrate data on the IUCN Red List. Full acknowledgments are provided in the supporting online material.

Supporting Online Material

www.sciencemag.org/cgi/content/full/science.1194442/DC1

Materials and Methods

Figs. S1 to S10

Tables S1 to S9

References

Acknowledgments

29 June 2010; accepted 11 October 2010

Published online 26 October 2010;

10.1126/science.1194442

Supporting Online Material for

The Impact of Conservation on the Status of the World's Vertebrates

Michael Hoffmann,* Craig Hilton-Taylor, Ariadne Angulo, Monika Böhm, Thomas M. Brooks, Stuart H. M. Butchart, Kent E. Carpenter, Janice Chanson, Ben Collen, Neil A. Cox, William R. T. Darwall, Nicholas K. Dulvy, Lucy R. Harrison, Vineet Katariya, Caroline M. Pollock, Suhel Quader, Nadia I. Richman, Ana S. L. Rodrigues, Marcelo F. Tognelli, Jean-Christophe Vié, John M. Aguiar, David J. Allen, Gerald R. Allen, Giovanni Amori, Natalia B. Ananjeva, Franco Andreone, Paul Andrew, Aida Luz Aquino Ortiz, Jonathan E. M. Baillie, Ricardo Baldi, Ben D. Bell, S. D. Biju, Jeremy P. Bird, Patricia Black-Decima, J. Julian Blanc, Federico Bolaños, Wilmar Bolívar-G., Ian J. Burfield, James A. Burton, David R. Capper, Fernando Castro, Gianluca Catullo, Rachel D. Cavanagh, Alan Channing, Ning Labbish Chao, Anna M. Chenery, Federica Chiozza, Viola Clausnitzer, Nigel J. Collar, Leah C. Collett, Bruce B. Collette, Claudia F. Cortez Fernandez, Matthew T. Craig, Michael J. Crosby, Neil Cumberlidge, Annabelle Cuttelod, Andrew E. Derocher, Arvin C. Diesmos, John S. Donaldson, J. W. Duckworth, Guy Dutson, S. K. Dutta, Richard H. Emslie, Aljos Farjon, Sarah Fowler, Jörg Freyhof, David L. Garshelis, Justin Gerlach, David J. Gower, Tandora D. Grant, Geoffrey A. Hammerson, Richard B. Harris, Lawrence R. Heaney, S. Blair Hedges, Jean-Marc Hero, Baz Hughes, Syed Ainul Hussain, Javier Icochea M., Robert F. Inger, Nobuo Ishii, Djoko T. Iskandar, Richard K. B. Jenkins, Yoshio Kaneko, Maurice Kottelat, Kit M. Kovacs, Sergius L. Kuzmin, Enrique La Marca, John F. Lamoreux, Michael W. N. Lau, Esteban O. Lavilla, Kristin Leus, Rebecca L. Lewison, Gabriela Lichtenstein, Suzanne R. Livingstone, Vimoksalehi Lukoschek, David P. Mallon, Philip J. K. McGowan, Anna McIvor, Patricia D. Moehlman, Sanjay Molur, Antonio Muñoz Alonso, John A. Musick, Kristin Nowell, Ronald A. Nussbaum, Wanda Olech, Nikolay L. Orlov, Theodore J. Papenfuss, Gabriela Parra-Olea, William F. Perrin, Beth A. Polidoro, Mohammad Pourkazemi, Paul A. Racey, James S. Raggle, Mala Ram, Galen Rathbun, Robert P. Reynolds, Anders G. J. Rhodin, Stephen J. Richards, Lily O. Rodríguez, Santiago R. Ron, Carlo Rondinini, Anthony B. Rylands, Yvonne Sadovy de Mitcheson, Jonnell C. Sanciangco, Kate L. Sanders, Georgina Santos-Barrera, Jan Schipper, Caryn Self-Sullivan, Yichuan Shi, Alan Shoemaker, Frederick T. Short, Claudio Sillero-Zubiri, Débora L. Silvano, Kevin G. Smith, Andrew T. Smith, Jos Snoeks, Alison J. Stattersfield, Andrew J. Symes, Andrew B. Taber, Bibhab K. Talukdar, Helen J. Temple, Rob Timmins, Joseph A. Tobias, Katerina Tsytulsina, Denis Tweddle, Carmen Ubeda, Sarah V. Valenti, Peter Paul van Dijk, Liza M. Veiga, Alberto Veloso, David C. Wege, Mark Wilkinson, Elizabeth A. Williamson, Feng Xie, Bruce E. Young, H. Resit Akçakaya, Leon Bennun, Tim M. Blackburn, Luigi Boitani, Holly T. Dublin, Gustavo A. B. da Fonseca, Claude Gascon, Thomas E. Lacher Jr., Georgina M. Mace, Susan A. Mainka, Jeffery A. McNeely, Russell A. Mittermeier, Gordon McGregor Reid, Jon Paul Rodriguez, Andrew A. Rosenberg, Michael J. Samways, Jane Smart, Bruce A. Stein, Simon N. Stuart

*To whom correspondence should be addressed. E-mail: mike.hoffmann@iucn.org

Published 26 October 2010 on *Science* Express
DOI: 10.1126/science.1194442

This PDF file includes:

Materials and Methods

SOM Text

Figs. S1 to S14

Tables S1 to S10

References

1 Materials

1.1 Introduction: The IUCN Red List of Threatened Species

For five decades, IUCN (the International Union for Conservation of Nature), mainly through its Species Survival Commission (SSC), has been assessing the conservation status of species, subspecies, and populations on a global scale in order to highlight taxa at risk of extinction, and thereby promote their conservation. Today, IUCN remains committed to providing the world with the most objective, scientifically based information on the current status of global biodiversity to help inform conservation planning, management, monitoring and decision making (S1,2). IUCN disseminates information on the taxonomy, conservation status and distribution of taxa through the *IUCN Red List of Threatened Species* (S3). The IUCN Red List is supported by a collaboration of Red List Partners: BirdLife International; Botanic Gardens Conservation International; Conservation International; Department of Animal and Human Biology, Sapienza University of Rome; NatureServe; Royal Botanic Gardens, Kew; Texas A&M University; Wildscreen, and the Zoological Society of London.

As part of IUCN's efforts to rapidly expand the taxonomic and geographic coverage of the IUCN Red List, and to provide a core set of supporting documentation to underpin the IUCN Red List assessments, IUCN, in collaboration with the broader Red List Partnership, pioneered a series of global, comprehensive species assessments that provide an effective method for gathering, synthesizing, reviewing and disseminating the most accurate scientific data available for biodiversity conservation. To date, comprehensive species assessments have been completed for, among others: all of the world's amphibians (S4,5); mammals (S6); birds (most recently, S7); cartilaginous fishes (this paper); zoothanophore, reef-building corals (S8); freshwater crabs (S9); freshwater crayfishes (this paper); mangroves (S10); seagrasses (this paper); conifers (S11); and cycads (S12, and revised this paper). Global, comprehensive assessments are ongoing for many other taxa in order to remedy known biases in coverage (S13).

A complementary strategy also has been developed to help increase coverage of species groups which have to date been under-represented on the Red List (S14), and for which global, comprehensive assessments may be difficult or even unachievable due to knowledge, time and financial constraints. When integrated with the IUCN Red List Index methodology (S15,16), the approach permits the assessment of the conservation status and trends of speciose taxonomic groups. Red List assessments are undertaken on a random sample of 1,500 species, which is large enough to accommodate potentially high numbers of Data Deficient species in the sample and also to buffer against falsely detecting an improvement in conservation status (meaning a reduction in the rate of biodiversity loss) when the real trend is actually negative. For example, the probability of false detection never exceeded 5% for a sample size of 900 species or more, based on an analysis of 50,000 subsamples of complete datasets for birds and amphibians (S14). The

subset of species is randomly selected amongst all currently described species in the taxon; stratification by attributes such as taxonomic group, phylogenetic status, biogeographic realm, and ecosystem, is not possible due to the lack of knowledge or stability of these attributes until the assessment is completed (*S14*). To date, assessments using the sampled methodology have been undertaken for the dragonflies and damselflies (*S17*), reptiles, and bony fishes, with sampled assessments currently underway for butterflies, dung beetles and monocotyledonous plants (*S18*).

The current paper represents a combined analysis of four completely and comprehensively assessed vertebrate groups (birds, mammals, amphibians, cartilaginous fishes), and two vertebrate groups for which statistically representative, random sample assessments have been conducted (reptiles and bony fishes). In the case of reptiles and fishes, some taxonomic groups have been completely and comprehensively assessed, such as all groupers (subfamily Epinephelinae), wrasses (family Labridae), sturgeons (family Acipenseridae), sea snakes and sea kraits (subfamily Hydrophiinae), mud-snakes (family Homalopsidae), file snakes (family Acrochordidae), crocodiles and alligators (order Crocodylia) and chelonians (*S19*). Representatives of these groups are included within the random sample assessments. In addition, the reptile and fish faunas of several regions have been comprehensively assessed. For reptiles, these include all endemic species for: North America and Mexico; Europe (*S20*); Mediterranean (*S21*); Philippines; and Seychelles. For fishes, these include: southern Africa (*S22*); East Africa (*S23*); West Africa (*S24*); Mediterranean (*S25*); Madagascar (*S26*); and Europe (*S27*). In Fig 1 (and Table S2), data for vertebrates are complemented by data collated for invertebrate and plant groups in both global (reef-building corals, freshwater crabs, freshwater crayfish, cycads, conifers, and seagrasses) and sampled (dragonflies and damselflies) approaches (references above).

Each species has been assigned a category of threat using the IUCN Red List system (*S28,29*), and is underpinned by a suite of supporting information, incorporating data on distribution, population numbers and trends, habitat, life history, threats, conservation actions, conservation status, and utilization for each individual species. The resulting data, covering 25,780 recently extant species, represent the culmination of a systematic collection and documentation process conducted over a period of some five decades, involving a partnership of numerous institutions, universities and museums, review at 92 workshops, and the contributions of several thousand experts.

1.2 The IUCN Red List process and data compilation

The IUCN Species Survival Commission is an established knowledge network of ~8,000 volunteer members working in almost every country of the world. The IUCN Species Survival Commission (SSC) and IUCN Species Programme are jointly responsible for maintaining and developing the IUCN Red List of Threatened Species. In order to maintain the credibility of the IUCN Red List, the SSC has formalized the process by which species can be included on the list. In particular, this process includes the designation of Red List Authorities (RLAs).

In general, there are three routes by which assessments feed onto the IUCN Red List:

Red List Authorities (RLA). The majority of RLAs are within one of the ~120 IUCN SSC Specialist Groups, but they can also be independent networks (termed “Stand-alone Red List Authorities”), or IUCN Red List Partner institutions (e.g., BirdLife International, NatureServe) and other organizations (e.g., Project Seahorse).

IUCN Species Programme and Red List Partner projects. These include the global biodiversity assessments (e.g., Global Amphibian Assessment, Global Mammal Assessment, Global Marine Species Assessment), and regional biodiversity assessment projects (e.g., Mediterranean biodiversity assessments, African freshwater biodiversity assessments) and assessments for the Sampled Red List Index (SRLI) run by the Zoological Society of London and the Royal Botanic Gardens Kew.

External projects. Red List assessments resulting from projects carried out by individuals, academia, and organizations outside of the IUCN network (this includes national Red List initiatives).

All three routes use the same basic process for preparing and submitting assessments for publication: data are gathered and provided by “contributors”; “assessors” use the data and the IUCN Red List Categories and Criteria to assess the species, and to document the assessment; the assessment is reviewed by at least two “reviewers”; accepted reviewed assessments are published on the IUCN Red List. But, the specific activities involved in the process may differ depending on the route. The steps involved in the IUCN Red List Process are presented schematically in Fig 1 and outlined further below.

Pre-assessment

In all cases, the starting point is usually data and information held in published papers, articles, books and reports, unpublished documents and reports, unpublished data, databases, GIS data, satellite imagery, etc. Prior to the assessment phase, these data are gathered, ideally in a format compatible with the standards of the Red List Categories and Criteria and supporting documentation requirements (see section 1.3). Individuals who provide data through the pre-assessment phase are termed “contributors”.

RLA

The RLA reviews available data sources (e.g., from field based studies, workshops, other institutions) and compiles current data. This may be done by one member of the RLA working alone; or by a small group of members working together; or through contributions from the multiple RLA members and additional experts via a large workshop, e-mail correspondence, or an internet-based discussion forum (e.g., the discussion fora run by BirdLife International). The method used is likely to depend on the number of species to be assessed and the range of data sources to be checked, and the RLA is responsible for deciding how it will approach data compilation.

Species Programme and Red List Partner projects

There are two approaches to data compilation used by Species Programme and Red List Partner projects:

1. Projects involving data compilation and assessment only: i) RLAs provide most of the data, with other data coming from published sources and other institutions. Project staff or expert consultants review data sources (reviewing literature and contacting RLAs and institutions) and data are aggregated in species accounts in the IUCN Species Information Service (SIS); and/or ii) other experts contribute data during an assessment workshop (see “Assessment”).
2. Projects involving regional capacity-building: i) participants in the project (experts from specific regions or with particular taxonomic expertise) are given Red List training (one workshop); ii) experts review data sources and compile data in species accounts in SIS (sometimes data collection is initiated by IUCN staff, then project participants add to this); and/or iii) other experts contribute data during an assessment review workshop (see “Assessment”).

External projects

As for the RLA above, the individual or organization involved is responsible for deciding how they will approach data compilation.

Assessment

All assessments are based on data currently available for taxa across their entire global ranges, and must follow the IUCN Red List Categories and Criteria (*S28*) and the guidelines for applying these (*S30*). Each assessment is documented according to the requirements detailed under “Data collected”.

RLA

Assessments may be carried out by one member of the RLA working alone; or by a small group of members working together; or by consensus agreement of a large group of members in a workshop, via e-mail, or through an internet-based discussion forum (see “Pre-assessment” above), and may include review of assessments by external experts as well as RLA members. RLA members may also be involved in one or more of the Species Programme or Red List Partner projects.

Species Programme and Red List Partner Projects

There are two approaches to assessments used by Species Programme and Red List Partner projects:

1. Projects involving data compilation and assessment only: i) an assessment workshop is held where experts review compiled data and add to or correct these appropriately. Project staff members adjust species accounts accordingly and assessments are carried out in working groups; ii) in some cases, no workshop is held, but data gathered by project staff are used to obtain ‘draft assessments’. Those are then sent out by e-mail to experts for review; iii) project staff tidy the species accounts (including range maps) and post PDF species accounts on a secure ftp site accessible by experts; iv) experts review assessments, and staff members modify information and assessments where necessary; and v) project staff members carry out a consistency check on assessments to ensure IUCN Red List Categories and Criteria are being applied consistently. Increasingly, this process is also facilitated and handled through SIS.
2. Projects involving regional capacity-building: i) experts involved in data compilation do a preliminary assessment based on the information they have gathered; ii) an assessment review workshop is held where experts review compiled data and preliminary assessments and add to or correct these appropriately. Project staff members adjust species accounts accordingly; iii) project staff tidy the species accounts (including range maps) and post PDF species accounts on secure ftp site accessible by experts; iv) experts review assessments, and staff members modify information and assessments where necessary; and v) project staff members carry out a consistency check on assessments to ensure IUCN Red List Categories and Criteria are being applied consistently. If any assessment needs to be altered as a result of the consistency check, the assessors are informed of these and the rationale for these changes. As for point 1, increasingly this process is facilitated and handled through SIS.

External projects

As for the RLA, the individual or organization involved is responsible for deciding how they will approach data compilation. Individuals and organizations may also be involved in one or more of the Species Programme or Red List Partner projects.

Review

All assessments must go through a review process before they can be accepted on the IUCN Red List. This involves at least two experts in the IUCN assessment process reviewing the assessment and agreeing that the data used have been interpreted correctly and consistently, and that uncertainty has been handled appropriately. In addition, for assessments that have not been carried out using the ‘criteria calculator’ option in SIS (which automatically assigns the criteria triggered from the underlying parameter estimates), the review process checks whether the IUCN Red List Categories and Criteria have been correctly applied and that the parameter estimates are consistent with the Category and Criteria entered.

RLA

Each RLA has a Focal Point who is responsible for ensuring that each assessment is reviewed by at least two people. The reviewers must operate independently, and none of them can have carried out the assessment. Review may be done by: a) the RLA focal point contacting appropriate experts on the IUCN assessment process from within the RLA membership, or seeking appropriate experts from outside the RLA; or b) a review workshop involving a small group of RLA members or others reviewing assessments to be submitted to the IUCN Red List.

Assessment and review may be carried out at the same workshop, where an individual or a small group prepares an assessment, and then review is carried by independent experts in the IUCN Red List process who are also at the workshop. Both in workshops and in other situations, review and assessment may not be entirely sequential, as guidance on appropriate interpretation of data and consistent approaches to handling uncertainty may be provided by reviewers throughout the assessment process.

Species Programme and Red List Partner Projects

All global Red List assessments resulting from Species Programme or Red List Partner projects must be reviewed by at least two people. All reviews must involve the appropriate RLAs. Staff members coordinating the project are responsible for referring assessments to the appropriate RLA for review. As for RLAs, assessment and review may be carried out at the same workshop, where an individual or a small group prepares an assessment, and then review is carried by independent experts in the IUCN Red List process who are also at the workshop. In cases where a new taxonomic group is being assessed, there may not yet be an appointed Red List Authority for that group. In such cases the project coordinators may act as the reviewers.

External projects

Global assessments resulting from projects run by other individuals or organizations do not need to be reviewed before reaching the IUCN Red List Unit. Red List Unit staff members are responsible for: a) checking the assessments to ensure that the Red List Categories and Criteria have been applied appropriately and that sufficient supporting documentation has been provided; b) referring all external assessments to the appropriate RLA or other experts (in cases where no RLA has been appointed to cover the taxon) for review; and c) informing assessors (or those who submitted the assessments) of the outcome of the review, returning any assessments that were not accepted in the review process.

Submission

Assessments are submitted to the IUCN Species Programme.

RLA

The RLA focal point submits assessments to the Red List Unit on behalf of the RLA. Red List Unit staff will then: a) acknowledge receipt of the assessments; b) check the

taxonomy used against taxonomy used in the IUCN Red List; c) check assessments to ensure the Red List Criteria have been applied appropriately; d) check supporting documentation to ensure it meets IUCN requirements; e) transfer long sections of documentation, tables, graphs, etc. to pdf documents to be published alongside the appropriate species account with a direct link to these; f) proof-read assessments and correct grammar and spelling where necessary; and g) contact the RLA focal point if any errors or omissions are detected or edits/changes required.

Species Programme and Red List Partner Projects

Project coordinators are responsible for checking criteria use, supporting documentation, and overall consistency, as well as carrying out proofreading and formatting before submission to the RLU. Red List Unit staff will then carry out the same checks noted above, but to a much lesser extent (since project staff should already have completed data-tidying, proof reading and consistency checks). The RLU staff will focus on looking for obvious errors and problems in overall consistency between assessment projects. Project coordinators are notified of any errors spotted.

External projects

Un-reviewed global assessments resulting from projects run by other individuals or organizations are submitted directly to the IUCN Red List Unit, where they are checked and if adequate are sent out for review.

Publication

All assessments that have been reviewed, accepted and checked are entered into the central database and are published in the appropriate update of the IUCN Red List website (dependent on the date of submission).

Reassessments

The process for reassessing species may differ from the steps outlined above. Typically, the initial stage involves collating any new published or unpublished information available (either relevant to the species in question or relevant contextual information), and soliciting additional relevant data and information. These are used to update the data and text fields, and if new parameter estimates trigger higher, lower or different criteria thresholds, the Red List Category and Criteria are revised. The updated and revised documentation may then be reviewed by species experts (within or beyond the RLA), and the revised assessments and accounts are reviewed by Red List assessment experts for appropriate and consistent interpretation of data and handling of uncertainty, before submission.

Workshops

As outlined above, a key part of the assessment process involves workshops. Workshops provide a platform for discussion, interaction, and group expert-review of species relationships, life-history data and distribution maps. Workshops have proven to be

productive in terms of maximizing available resources (both financial and in terms of expert time) to collate the greatest amount of species-based information within a relatively short time period. Workshops are more commonly used in creating the initial baseline data of a global assessment than in reassessments. For the vertebrate datasets that form part of the current analysis, the following workshops were held:

Mammals

1. Africa (Small Mammals) - January 24–30, 2004 (United Kingdom)
2. South Asia (Non-volant Small Mammals) - February 9-15, 2004 (India)
3. Southeast Asia (initial assessment workshop) - May 3-7, 2004 (Thailand)
4. Africa (Small Mammals, maps only) - August 22-26, 2004 (United Kingdom)
5. Philippines (initial assessment workshop) - November 2-3, 2004 (United States)
6. Edentates – December 17-18, 2004 (Brazil)
7. African Primates – January 26-30, 2005 (United States)
8. Madagascar – April 4-8, 2005 (Madagascar)
9. Sirenia – August 1, 2005 (Japan)
10. Japan – August 6-8, 2005 (Japan)
11. Australia/Pacific – August 15-19, 2005 (Australia)
12. Brazil and Guianas – October 16-19, 2005 (Brazil)
13. Mongolia – October 31 - November 4, 2005 (Mongolia)
14. Southwest Asia – November 22-25, 2005 (Turkey)
15. Andes (Small Mammals) – February 6-10, 2006 (Colombia)
16. Asian Squirrels – March 27-29, 2006 (India)
17. Philippines – April 9-10, 2006 (Philippines)
18. Southeast Asia (Large Mammals and Bats) – May 2-6, 2006 (Indonesia)
19. Southeast Asia (Rodents) – May 2-5, 2006 (United States)
20. Europe – May 18-22, 2006 (Austria)
21. Old World small Carnivores – July 3-7, 2006 (Viet Nam)
22. Asian Primates – September 7-12, 2006 (Cambodia)
23. Cetaceans – January 22-26, 2007 (United States)
24. Southern Cone – October 8-12, 2006 (Brazil)
25. Cats – September 21-22, 2007 (United Kingdom)
26. Mediterranean – October 29 – November 2, 2007 (Spain)
27. Neotropical Primates – November 28 - December 02, 2007 (United States)
28. Mesoamerica and the Caribbean (Small Mammals) – January 25-30, 2008 (Honduras)

Amphibians

1. Australia – February, 2001 (Tasmania)
2. China and the Koreas – March, 2002 (China)
3. Sub-Saharan Africa – April, 2002 (Kenya)
4. South Asia – July, 2002 (India)
5. Southeast Asia – September / October, 2002 (Thailand)
6. Mesoamerica (Mexico south through Panama) – November, 2002 (Costa Rica)
7. The Papuan Region – February, 2003 (United States)
8. Tropical South America, East of the Andes – March / April, 2003 (Brazil)
9. Tropical Andes – August, 2003 (Ecuador)

10. Madagascar – September, 2003 (Switzerland)
11. Chile – October, 2003 (Chile)
12. Argentina and Uruguay – October, 2003 (Argentina)
13. Caecilians – February, 2004 (London)
14. Caribbean – March, 2004 (Dominican Republic)
15. Mediterranean – December, 2004 (Spain)
16. Costa Rica – August, 2007 (Costa Rica)
17. Central American salamanders and caecilians – August, 2007 (Mexico)
18. Europe, Turkey, Caucasus, Iran and Iraq – September, 2008 (Turkey)

Birds

As mentioned elsewhere, the process for review of reassessments of birds on the IUCN Red List is facilitated by means of BirdLife's Threatened Birds fora (http://www.birdlife.org/action/science/species/global_species_programme/gtb_forums.html)

Cartilaginous fishes

1. Australia and Oceania – March, 2003 (Australia)
2. South America – June, 2002 (Brazil)
3. Sub-equatorial Africa – September, 2003 (South Africa)
4. Mediterranean – October, 2003 (San Marino)
5. Deep Sea sharks – November, 2003 (New Zealand)
6. Northwest and Central America – June, 2004 (Florida, USA)
7. Batoids (skates and rays) – September, 2004 (South Africa)
8. Northeast Atlantic – February, 2006 (United Kingdom)
9. West Africa – June, 2006 (Senegal)
10. Pelagic sharks – February, 2007 (United Kingdom)
11. Northwest Pacific / Southeast Asia – June/July, 2007 (Philippines)
12. Expert Panel Review – March, 2005 and July, 2006 (United Kingdom)

Reptiles

1. Asian Tortoises and Freshwater Turtles – December 1999 (Cambodia)
2. Mediterranean – December, 2004 (Spain)
3. Mexico – September, 2005 (Mexico)
4. European (excl. Mediterranean) – September / October, 2005 (Germany)
5. India Tortoises and Freshwater Turtles – October 2005 (India)
6. Mediterranean Tortoises and Freshwater Turtles (2nd workshop) – February 2006 (Greece)
7. Philippines – April, 2007 (Philippines)
8. Madagascar Tortoises and Freshwater Turtles – January 2008 (Madagascar)
9. Europe, Turkey, Caucasus, Iran and Iraq – September, 2008 (Turkey)
10. Iguanas – October, 2009 (Dominica)
11. Australia Tortoises and Freshwater Turtles – February, 2009 (Australia)
12. Sea snakes, sea kraits, mud snakes and file snakes – February, 2009 (Australia)
13. Mid-western USA Freshwater Turtles – August 2009 (USA)
14. New Caledonia – February, 2010 (New Caledonia)

Bony fishes

1. Madagascar (assessment) – May, 2001 (Madagascar)
2. East Africa (training) – May, 2003 (Kenya)
3. East Africa (review) – December, 2003 (Uganda)
4. Southern Africa (training) – May, 2005 (South Africa)
5. West Africa (training) - July, 2005 (Senegal)
6. Southern Africa (review) – June, 2006 (South Africa)
7. West Africa (review) - July, 2006 (Ghana)
8. Europe – December, 2006 (Germany)
9. Mediterranean (training) – February, 2007 (Morocco)
10. Groupers – February, 2007 (Hong Kong)
11. Freshwater fishes (sample) – March, 2007 (United Kingdom)
12. Eastern Tropical Pacific Fishes I – May, 2007 (Panama)
13. Mediterranean (review) – October, 2007 (Portugal)
14. Eastern Tropical Pacific Fishes I – April, 2008 (Costa Rica)
15. Central Africa (review) – June, 2008 (Cameroon)
16. Global wrasses I – December, 2008 (Brazil)
17. Marine fishes (sample) – January, 2009 (United Kingdom)
18. Global wrasses II – March, 2009 (Philippines)
19. Continental Africa (review) – May, 2009 (Egypt)
20. Sturgeons – October, 2009 (China)

1.3 Data collected

The IUCN Red List process aims to collate comprehensive, expert-reviewed data on the distribution, abundance, population trends, ecology, habitat preferences, threats, utilization, conservation actions, and conservation status for all currently recognized wild species. Each species is also coded according to standardized Threats and Conservation Actions Classification Schemes (S3I), making it possible to analyze, for example, the relative importance of major threats. More specifically, the following data were collected on each species:

Systematics

For each species, data were collected on species, genus, family, order, taxonomic authority, English and other common names (if any), and taxonomic notes (if needed, normally used to clarify difficult or confusing issues).

We rely on accepted taxonomic sources to provide our taxonomic framework (Table S1). However, in some cases, it is necessary to depart from these standard lexicons in well-justified circumstances. In such cases, and except in very exceptional circumstances, any newly recognized species (either newly described or recently removed from synonymy) or any other proposed taxonomic change had to be published in a peer-reviewed journal or other authoritative taxonomic work (e.g., a major faunistic treatise). Although the IUCN Red List is not intended to be a definitive taxonomic source, it strives to be taxonomically coherent and consistent at all ranks. Again, our higher-level classification invariably follows accepted classifications, but again deviates in some respects. See <http://www.iucnredlist.org/technical-documents/information-sources-and-quality> for further information.

General information

General text information was compiled on: geographic range; population (usually a qualitative assessment of abundance or rarity in the absence of quantitative information); habitat and ecology (including, in particular, habitat preferences and ability to adapt to anthropogenic disturbance, as well as any particular biological traits that may render a species particularly vulnerable); threats; and conservation actions (including occurrence in protected areas).

Distribution maps

As part of the minimum supporting documentation for completing an IUCN Red List assessment, we mapped the distributions of each species in ESRI shapefile format (ArcView GIS 3.x and 9.x). The maps take the form of broad polygons that join known locations. A species' distribution map can consist of more than one polygon where there

is an obvious discontinuity in suitable habitat. For some range-restricted taxa, we have tried to map distribution ranges with a higher degree of accuracy, sometimes down to the level of individual subpopulations. Individual polygons are coded according to species' presence (1 – extant; 2 – probably extant; 3 – possibly extant; 4 – possibly extinct; 5 – extinct), origin (1 – native; 2 – reintroduced; 3 – introduced; 4 – vagrant; 5 – origin uncertain) and seasonality (1 – resident; 2 – breeding season; 3 – non-breeding season; 4 – passage; 5 – seasonal occurrence uncertain). These categories are described in the metadata file that accompanies the shapefiles (downloadable from S3).

Note that in the case of some freshwater fishes, distribution maps record species distributions according to their presence (extant and probably extant) within sub-catchments. The sub-catchment dataset is derived from Hydro1k6 and 7 (http://eros.usgs.gov/#/Find_Data/Products_and_Data_Available/gtopo30/hydro), which provides hydrographic information at the global and regional scale. In the case of marine bony fishes, coastal polygons are clipped to a union of a 100km buffer and 200m bathymetry. In the case of marine cartilaginous fishes, polygons are clipped to one of several standardized base-maps depending on the ecology of the species (i.e. coastal, pelagic, deeper living species).

Country occurrence

A list of countries of occurrence is coded, noting whether or not it is native extant, extinct, possibly extinct, introduced or re-introduced. Country tables showing numbers of Threatened species per country, and numbers of endemics and Threatened endemics per country are available via the IUCN Red List website (<http://www.iucnredlist.org/about/summary-statistics>).

System

Each species is coded according to its occurrence in terrestrial, marine and/or freshwater systems.

Biogeographic realm

Terrestrial and freshwater species are coded according to their presence in any of nine biogeographic realms, following the classification of (S32).

Current population trends

Current known or inferred trends of each species' overall population, described as *increasing, decreasing, stable, or unknown*.

Habitat preferences

Each species is coded against the IUCN Habitats Classification Scheme (<http://www.iucnredlist.org/technical-documents/classification-schemes/habitats-classification-scheme-ver3>), with suitability and importance noted.

Major threats

Each species is coded against the IUCN Threats Classification Scheme (<http://www.iucnredlist.org/technical-documents/classification-schemes/threats-classification-scheme-ver3>). Currently, only birds have their threats coded up to indicate timing, scope, severity, and impact (<http://www.birdlife.org/datazone/species/terms/threats.html>), but coding up “timing” is now required as part of the minimum supporting documentation for all new assessments.

Conservation actions

As far as possible, each species is coded against the IUCN Conservation Actions Classification Scheme (<http://www.iucnredlist.org/technical-documents/classification-schemes/conservation-actions-classification-scheme-ver2>). This scheme captures information on both actions currently in place (a reduced set of options), and the most urgent actions needed in the short-term. Species that are listed on any of the CITES appendices are also indicated. Research actions needed (e.g., monitoring) are coded separately.

Utilization

Each species is coded against the IUCN Utilization Classification Scheme (focusing on the purpose/type of use, the primary forms removed from the wild, and the source of specimens in commercial trade).

IUCN Red List assessment

Based on the information above, we used the 2001 IUCN Red List Categories and Criteria (Version 3.1) (S28,29) to undertake an assessment of extinction risk for each vertebrate species. The IUCN Red List Categories and Criteria are the most widely accepted system for classifying extinction risk at the species level (S1,33-35), and as noted above have already been used in several other global assessments to date. The IUCN Red List Categories include eight different categories (Fig 2): Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC) and Data Deficient (DD). The categories Least Concern through Extinct (i.e., not including Data Deficient) are “categories of threat”. A species qualifies for one of the three Threatened categories (CR, EN, or VU) by meeting a critical threshold for that category in one of five different available criteria (A-E). The criteria are designed to be objective, quantitative, repeatable, and to handle uncertainty. Two special tags (Possibly Extinct and Possibly Extinct in the

Wild), under the category Critically Endangered, have been developed to indicate species for which there remains some reasonable doubt that a species is Extinct or Extinct in the Wild (S30,36).

Each IUCN Red List assessment is accompanied by a rationale that explains how the supporting documentation was used to justify the assessment, date of assessment, names of assessors and reviewers, and any notes relating to IUCN Red Listing (e.g., any important issues, assumptions or inferences in deciding the category).

Assessments are done globally at the species level, integrating the information across all populations and/or subspecies. Threat categories, therefore, reflect the overall conservation status of the species, which may, for example, be of Least Concern despite particular populations/subspecies being at risk. In some cases subspecies and/or populations are also assessed separately, but these results are not included in the statistics and analyses presented in this paper.

Reasons for change

Between any two assessments, species may change categories for both “genuine” and “non-genuine” reasons (S15,16). Correct determination of whether or not a change in status between assessment periods is genuine or not has relevance to calculating the Red List Index, because only genuine changes are included in the RLI calculation (section 2.4). Species may undergo non-genuine changes in categories across assessment periods due to criteria revision (a new set of criteria were introduced in 2001), improved knowledge (e.g., better estimates for population size, range size or rate of decline), changes in taxonomy, a mistake or previously incorrect application of the criteria, or for some other reason (e.g., change in assessor’s attitude to risk and uncertainty and changes in the IUCN guidelines for applying the criteria). Genuine changes involve either a real deterioration (i.e., moving from a lower to a higher category of threat, largely due to the impact of a new or expanding threatening process) or improvement (i.e., moving from a higher to a lower category of threat due to a threat being mitigated) in status.

Many category changes result from a combination of improved knowledge and some element of genuine deterioration or improvement in status. In such cases, “genuine” is only assigned as a reason for change if the amount of change (e.g., population size change, decline rate change) is sufficient on its own to cross the relevant Red List category threshold.

Some rules govern the movement of taxa between categories: 1) A taxon may be moved from a category of higher threat to a category of lower threat if none of the criteria of the higher category has been met for five years or more (species awaiting listing in a lower category of threat are usually indicated as such, e.g., Arabian Oryx *Oryx leucoryx*, eligible listing as Vulnerable in 2011). However, if the taxon is being moved from Extinct in the Wild as a result of the establishment of a reintroduced population, this period must be five years or until viable offspring are produced, whichever is the longer. 2) If the original classification is found to have been erroneous, the taxon may be transferred to the appropriate category or

removed from the Threatened categories altogether, without delay. However, in this case, the taxon should be re-evaluated against all the criteria to clarify its status. 3) Transfer from categories of lower to higher risk should be made without delay.

Bibliography

A list of important references used to compile the information for each species assessment was recorded for each species.

1.4 Limitations of the data

Although every effort is made to keep the IUCN Red List current and up-to-date, there are known limitations to the data and in coverage. In particular, the following should be noted:

Missing species and species coverage

Although we have endeavored to trace all recently described species, it is possible that some recently described species, or taxonomic changes, may have eluded our attention, especially if published in obscure media. There is also often a lag time before species are included on the IUCN Red List, and at the pace of current species descriptions in some groups (e.g., amphibians, S37) it is not always possible to keep the Red List 100% up-to-date.

Many species in some parts of the world remain poorly known, including, for example, the Andes, most of Central Africa and parts of West Africa, Angola, parts of South and Southeast Asia, and Melanesia. In addition, many species' names, especially in the tropics, actually represent complexes of several species that have not yet been resolved. For our purposes, and pending the availability of published information to the contrary, these are treated as single species, until resolution of their taxonomic status is published. Ongoing studies are evidencing unheralded diversity in already speciose faunas (e.g., S39).

Note that species known to have gone Extinct before 1500AD are not included on the Red List.

Domesticated species and *Homo sapiens*

Domestic species (e.g., Dromedary *Camelus dromedarius*; Domestic Goat *Capra hircus*; Domestic Sheep *Ovis aries*) are not included on the Red List. *Homo sapiens* is on the Red List, but is not included in the analysis.

Incomplete ranges

Because of the conservative approach taken in mapping species, the ranges for many species are likely to be minimum estimates of the limits of species' distributions. A rule was followed allowing interpolation of occurrence between known localities if the ecological conditions seemed appropriate, but not permitting extrapolation beyond known localities. In other words, to the best of our knowledge, maps represent current known limits within historical native range (any introductions are coded accordingly, and are excluded for the purposes of analysis), with the obvious caveat that species occurrence is not homogeneous within the polygon. Some species are, therefore, almost certain to

occur more widely than mapped. Because of this, some regions are recorded as having lower diversity than may eventually prove to be the case. On the other hand, species' ranges were mapped as generalized polygons which often include areas of unsuitable habitat, and therefore species may not occur in all of the areas where they are mapped.

Data Deficient species

A taxon is classified as Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. Data Deficient is a Red List category, but it is not a category of threat. Data Deficient does not mean little is known about a species, but instead reflects how little is known about processes affecting the species. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance, and/or distribution, and/or threats are lacking. Species assessed as Data Deficient should not be considered as "not Threatened". With further survey work and the availability of improved information, it is anticipated that many of these species, if indeed proven to be valid taxa, will be reassessed. This is a precautionary approach in accordance with the IUCN guidelines.

There are three non-exclusive reasons for a species being categorized as Data Deficient: unknown provenance; uncertain taxonomic status that explains paucity of data; and insufficient information. IUCN provides guidance that positive use should be made of whatever data are available, and cautions that if the range of a taxon is suspected to be relatively circumscribed and a considerable period of time has elapsed since the last record, Threatened status may well be justified. Furthermore, "the liberal use of Data Deficient is discouraged" because "taxa that are poorly known can often be assigned a threat category on the basis of background information concerning the deterioration of the habitat and/or other causal factors" (S30).

1.5 Data analyzed

A subset of those data collected, both tabular and spatial, was used in the present analyses.

Tabular data

The analyzed data included tabular information for 25,780 recently extant species:

Taxonomy: allocation of each species to genus, family, order and class.

Conservation status: each species' listing under one of the IUCN Red List Categories. Threatened species are those in the categories Critically Endangered, Endangered or Vulnerable.

Current population trends: Determination of current population trends may be based on parameters such as relative abundance, but is more often inferred from trends in habitat status and operating threats. Because this assumption may not always be met, it is possible that estimates of species with declining population trends may be overestimated. On the other hand, given the inherent precautionary leanings in the assessment process, estimates of species having stable or increasing trends may be an under-estimate.

Realms and systems: each species' presence in one or more of nine biogeographic realms (*sensu* 32) is recorded for terrestrial and freshwater species. In addition, each species' presence in one or more of the three systems (terrestrial, freshwater, marine) is coded. These terms are not mutually exclusive.

Conservation actions in place and needed: In these analyses we considered all conservation actions coded as in place and needed. Generally speaking, conservation actions are coded up based on a proven conservation need, and should reasonably be able to be achieved within the next five years.

Reasons for change: For the purposes of calculating the Red List Index (section 2.4), only those species known to have undergone genuine changes in status between global assessment time periods were considered.

Spatial data

Of the 25,536 extant species analysed in the current paper, distribution maps were available for 24,259 species, including 6,148 amphibians, 8,759 birds, 1,439 bony fishes, 5,375 mammals, 1,494 reptiles, and 1,044 sharks.

As described above, species' range maps are coarse generalizations of their distributions, generally obtained as 'envelopes' including original records (point data) and through interpolation (using, for example, habitat information) from original records. They may include relatively extensive areas from which the species is absent (e.g., terrestrial habitats within a freshwater species' range) and are therefore likely to overestimate the species' true area of occupancy (S39). This may affect mapped biodiversity patterns, for example of species richness and endemism. Nonetheless, at the coarse scale of the present analyses (spatial units $\sim 23,322.62 \text{ km}^2$, see below) this bias is not expected to significantly affect the global spatial patterns found (S39).

Most species' ranges were either wholly on land (including freshwater and volant species) or in the sea, but some species were mapped across both. For these 'cross-realm' species, their ranges were split into marine and land sections (using the coastline as the boundary) and analyzed separately (see below).

2 Methods

2.1 Estimates of the proportion of species Threatened

The true levels of threat we report are imperfectly known, because many species are categorized as Data Deficient (DD), meaning that there is insufficient information currently available to assess their risk of extinction (see section 1.4). Non-Data Deficient species are described throughout as ‘data sufficient’. The degree to which Data Deficient species are more likely to be Threatened than not introduces uncertainty to determining estimates of the proportion of species Threatened. One might expect a high proportion of Data Deficient species to be Least Concern in reality. On the other hand, given that many have small ranges they might be expected to have an elevated risk of extinction. Examining the fate of species formerly classified as Data Deficient and subsequently recategorized in a category of threat provides some insight: among birds, for example, 37 of 58 Data Deficient species that have been re-evaluated over time have been classified as Least Concern or Near Threatened, with 10 no longer recognized due to taxonomic revision (S40). However, it is not evident that this trend will hold in other taxa, particularly in groups such as amphibians with high discovery rates from regions experiencing high threat. Consequently, to account for the uncertainty that Data Deficient species introduce to estimates of proportions of species Threatened, we present three values (Fig 1 and Table S2):

- Lower bound: percentage of Threatened species among all species assessed, including Extinct and Extinct in the Wild (number of Threatened species divided by the total number of species assessed). This corresponds to the assumption that none of the Data Deficient species is Threatened. This is the most intuitive measure, but more than likely underestimates risk of extinction.
- Mid-point: percentage of Threatened species among those for which threat status could be determined (number of Threatened species divided by the number of data sufficient species, i.e., total number of species assessed minus Data Deficient). This corresponds to the assumption that Data Deficient species have the same fraction of Threatened species as data sufficient species. This represents a best estimate, and demonstrates that the true value lies somewhere between the upper and lower bound.
- Upper bound: percentage of Threatened or Data Deficient species among those assessed (number of Threatened or Data Deficient species divided by the total number of species assessed). This corresponds to the assumption that all of the Data Deficient species are Threatened. This is the most unrealistic estimate of extinction risk (S40).

Degree of uncertainty regarding the true level of threat is, therefore, greatest in cartilaginous fishes (range=17-64%; mid-point=33%) and least in birds (range=12-13%; mid-point=12%). Our knowledge of extinction risk in non-vertebrates in general is still poor, evidenced by the reasonable degree of uncertainty for taxa like the dragonflies and damselflies (Odonata: range=8-43%; mid-point=13%) and freshwater brachyurans (range=16-65%; mid-point=31%). At least for Odonata, the mid-point value reported here (13%) is comparable to the percentage of species likely to be Threatened reported by S17 (~15%).

As explained in the introduction, threat levels for reptiles and freshwater fish are based on statistically representative, random samples. It is likely that once these groups have been completely and comprehensively assessed, the true threat status of these taxa will be different, especially for freshwater fishes, where regional assessments report threat levels (for endemics only) ranging from 17% (Southern Africa) to 56% (Mediterranean) (S41).

To calculate the proportion of all vertebrate species Threatened (range=16-33%; mid-point=19%; Table S3), we calculated a weighted average to account for the total number of described species per higher taxon. For the completely assessed higher taxa (birds, mammals, amphibians and cartilaginous fishes), we used the percentage of species Threatened and multiplied this by the total number of extant assessed species in the taxon (per Table S2) to derive an absolute number of species estimated Threatened per taxonomic group. For the sampled higher taxa (reptiles, bony fishes), we used the percentage of species Threatened in the sample and multiplied this by the total number of described species in the taxon (given that the total number extant is not known) to derive an absolute number of species estimated Threatened per taxonomic group. The weighted average is then calculated as the sum of the absolute number of Threatened species for each taxonomic group divided by the total number of extant species.

We exclude species categorized as Extinct (since 1500 AD) from all calculations of proportion of species Threatened (see Fig 1). We include them in Table S2 with the caveat that the global scale of extinctions among reptiles and bony fishes (and other sampled groups) is not possible to determine in the absence of a full global assessment, although at least 112 losses have been documented (S3). There are no recorded extinctions among cartilaginous fishes, although many are locally and regionally extinct (S42).

2.2 Spatial units

Data were analyzed using a geodesic discrete global grid system, defined on an icosahedron and projected to the sphere using the inverse Icosahedral Snyder Equal Area (ISEA) Projection (S43). This corresponds to a hexagonal grid composed of individual units (cells) that retain their shape and area ($\sim 23,322 \text{ km}^2$) throughout the globe. These are more suitable for a range of ecological applications than the most commonly used rectangular grids (S44). A row of cells near latitude 180°E/W was excluded (Fig S3), as these interfered with the spatial analyses. This creates an artificial narrow band of no data

around all maps.

To avoid problems of “spillage” (i.e., double-counting of species with ranges mapped to coastlines), coastal cells were clipped to the coastline into land and marine sections. The range of each species was converted into the hexagonal grid for analysis purposes, with a species considered present in any given hexagon if its mapped range overlapped any part of that hexagon. Species whose ranges are over land (including freshwater species) were mapped to land hexagons (or the land portion of coastal cells), while species whose ranges are over the sea were mapped separately to marine hexagons (or the land portion of coastal cells). Some species had substantial ranges that crossed both land and marine realms, and consequently were mapped both into marine and into land cells (e.g., West African Manatee *Trichechus manatus*, which can range up to 2,000 km inland). Although many marine and freshwater fishes are anadromous and catadromous, respectively, for the purpose of the current analysis we mapped all freshwater fishes to land and all marine fishes to marine cells.

2.3 Global patterns of vertebrate diversity

Patterns of species richness (Fig 2, S4A) were mapped by counting the number of species in each cell (or cell section, for species with a coastal distribution). Only those polygons where the species was both reported as native or reintroduced (Origin coded as 1 or 2) and currently extant or probably extant (Presence coded as 1 or 2) and where seasonality was coded as resident, breeding season, non-breeding season, and passage migrant (Seasonality coded as 1, 2, 3, 4) were included, thus excluding historical and introduced ranges as well as any polygons where origin is uncertain as well as vagrancies and instances in which seasonal occurrence is unknown. The number of Threatened species in each cell (Fig 2) was mapped by counting the number of species in IUCN Categories Vulnerable, Endangered or Critically Endangered. It is important to note that much of the signal in these richness maps is driven by relatively common and widespread species (S45,46). The maps created in each analysis have patterns for marine species mapped on a blue scale, and patterns for land species mapped on a brown scale. Different numerical scales are used for land and marine, as the numbers of species differ by more than an order of magnitude.

To determine the relationship of species richness relative to Threatened species richness (Fig S4B), we determined total richness per cell for data sufficient species (i.e., the sum of all vertebrate occurrences, excluding Data Deficient species) and plotted this against the total number of Threatened species per cell, and then calculated the residuals. We then mapped the residuals with positive values in red (indicating cells that have more Threatened species than expected for their richness alone) and equal or negative values in gray (indicating cells that have the same or fewer Threatened species than expected for richness alone).

2.4 The Red List Index and number of species changing IUCN Red List categories

The Red List Index (RLI) (Fig 3) measures trends over time in the overall extinction risk of species, as measured by their category of extinction risk on the IUCN Red List. The RLI has been used to test whether the 2010 biodiversity target was met (*S47,48*) and is used to report against the indicator ‘proportion of species threatened with extinction’ for the United Nations Millennium Development Goal 7: ‘ensure environmental sustainability’ (*S49*).

The RLI methodology is elaborated upon in detail elsewhere (*S15*, updated by *S16*), but in its simplest form is the number of species in each Red List category weighted according to their Red List category (with weight 0 for Least Concern, 1 for Near Threatened, 2 for Vulnerable, 3 for Endangered, 4 for Critically Endangered and 5 for Extinct in the Wild and Extinct, as well as species flagged as Possibly Extinct and Possibly Extinct in the Wild under Critically Endangered), divided by the value obtained if all species were Extinct (i.e. the total number of species multiplied by 5), and subtracted from one. This produces a value from 1 to 0, with an RLI value of 1 equating to all species being categorized as Least Concern, and hence that none are expected to go extinct in the near future. An RLI value of 0 indicates that all species have gone Extinct. Ergo, a downwards trend in the graph line between two assessment points (i.e. declining RLI values) means that the expected rate of species extinctions is increasing. Data Deficient species are not included in the calculation of the RLI (*S16*). Indeed, any Data Deficient species subsequently reassigned to a category of threat will be for a “non-genuine” reason. For these species, past threat status is inferred using the best current knowledge, with the default assumption that unless there are reasons to think otherwise, past status was the same as current.

The formula for calculating the RLI requires that (i) exactly the same set of species is included in all time steps, and (ii) the only category changes included are those resulting from genuine improvement or deterioration in status (section 1.3: Reason for change). In other words, changes resulting from improved knowledge, taxonomic revision, or the 2001 change in criteria are excluded (such changes are termed “non-genuine”). In practice, species lists will often change slightly from one assessment to the next (e.g. owing to taxonomic revisions), and many species change category between assessments owing to improved knowledge of their population size, trends, distribution, threats etc. The RLI is only calculated after the earlier Red List categorizations are retrospectively corrected using the current information and taxonomy, to ensure that the same species are considered throughout and that only genuine changes in threat status are included. It is assumed that the current Red List Categories for the taxa have applied in previous assessments, unless there is information to the contrary that a genuine change in status has occurred. Such information is often contextual, e.g. relating to the known history of habitat loss within the range of the species (see *S16* for further details).

In general, a conservative approach is always adopted, and genuine status changes are only identified if adequate supporting evidence and justification can be provided. If there is insufficient information available to determine whether a newly assessed species has undergone a genuine status change since the first assessment period, then it is not incorporated into the IUCN RLI until it is assessed subsequently for a second time, at

which point categories for earlier assessments are assigned by determining recent trends in population, range, habitat and threats, supported by additional information.

To calculate the RLI, at least two datapoints are needed corresponding to complete assessments of all species according to the IUCN Red List. For birds, data come from the five complete assessments of all species for the years 1988 (*S50*), 1994 (*S51*), 2000 (*S52*), 2004 (*S53*) and 2008 (*S7*), updated by BirdLife International (*S54*). In the case of amphibians, Stuart *et al.* (*S4*) determined the IUCN Red List category for each species in 1980 based on the 2004 IUCN Red List assessment, and on information on population trends, habitat decline trends, threatening processes and conservation actions in the preceding 24 years. This was estimated conservatively, with the default category in 1980 being the same as in 2004 unless there was adequate evidence that a change had occurred. Examples of such evidence include: the disappearance of most, or all, of the population; catastrophic declines due to over-harvesting; or severe habitat loss for species with low tolerance of habitat disturbance. For mammals, a not dissimilar methodology was used. The IUCN Red List category for each species in 1996 was determined based on the 2008 assessments (*S6*), updated by IUCN (*S3*), informed by data obtained in a complete assessment that took place in that year (*S55*). In effect, then, these previous 1996 listings were retrospectively corrected using the best available current knowledge. As with amphibians, the default category was assumed to be the same as 2008, unless there was adequate evidence of a change.

Current Red List assessments for all three vertebrate groups are freely available (*S3*). The number of non-Data Deficient species extant at the start of the period are = 9,965 birds, 4,653 mammals, and 4,399 amphibians (Table S5). A list of all mammal, bird and amphibian species that underwent genuine changes in extinction risk is provided in Table S6. Note that for amphibians the classification reflects what was known and adopted in 2004.

Although the RLI permits one to discern the net overall effect of category changes over time, it obscures some of the detail about how species are moving between categories (i.e., category transitions). In Table 1, we summarize the net number of species qualifying for a change in IUCN Red List category between assessment years. The table demonstrates, for example, that 39 species of mammal deteriorated one category from Least Concern to Near Threatened between 1996 and 2008; similarly, eight species of mammal improved either one or two categories from Near Threatened or Vulnerable, respectively, to Least Concern. Although neither Critically Endangered (Possibly Extinct) nor Critically Endangered (Possibly Extinct in the Wild) are full Red List categories (section 1.3: IUCN Red List assessment), they are essentially treated as such (being equivalent to Extinct and Extinct in the Wild, as noted above) in the RLI methodology (*S15,16*) and consequently we show category transitions to and from CR(PE/PEW) in Table 1.

For birds, Table 1 shows both the net overall effect of category changes between the start (1988) and end (2008) dates, *and* (in parentheses) the sum of the absolute number of

category changes between any two assessment dates (i.e., 1988 to 1994; 1994 to 2000; 2000 to 2004; and 2004 to 2008). For example, of the 81 bird species that deteriorated one category from Least Concern to Near Threatened over the entire period (1988-2008), the majority (72) occurred in the 1994-2000 time-frame (Table S6). Consequently, the Christmas Hawk-owl *Ninox natalis*, which deteriorated two categories from Vulnerable to Critically Endangered between 1994 and 2004 and then improved by the same margin between 2000 and 2004, contributes nothing to the table in terms of net changes because the species started and ended the period in the same category. However, in terms of absolute numbers of changes, Christmas Hawk-owl is one of the 11 bird species that deteriorated from Vulnerable to Critically Endangered during the time-period, but also one of the three species that improved from Critically Endangered to Vulnerable.

Finally, to put the RLI declines in perspective, they can be equated with the number of species changing category and the number of categories (steps) moved, with changes between adjacent categories counting as one step (e.g., EN to CR) and those moving between non-adjacent categories as more than one step (e.g. VU to CR is two steps; NT to CR is three steps). Thus, the total number of step changes yielded is equivalent to the same number of species each moving one category higher in extinction risk. Dividing the total number of step changes per taxon by the number of years in the time period (662 step changes / 24 years for amphibians), yields an average number of step changes per year (28 for amphibians), equivalent to the number of species per year moving one category further along in extinction risk.

The RLI can be disaggregated to show trends in extinction risk for particular taxonomic groups, continents, biogeographic realms, habitats, and systems, for species relevant to particular policy mechanisms, or to explore trends in the importance and impacts of specific threats. Fig S9 shows disaggregation by system, which highlights the impact of long-line fishing through by-catch on the world's seabirds (particularly albatrosses and petrels). Freshwater-associated amphibians do not appear to be declining faster than predominantly/purely terrestrial amphibians, despite the former being more susceptible to chytrid-related declines, especially at high altitudes (S56); however, there are many highly adaptable freshwater species that face few threats (e.g., *Rana* spp.), whereas there are many direct-developing, small-range, highly susceptible terrestrial species (e.g., many species in the family Strabomantidae in Neotropics), including from regions where chytrid is not prevalent (e.g., *Philautus* spp. in Asia).

We repeat the caveat that the RLI does not incorporate population declines in species that are too slow or localized to warrant listing in a higher category of extinction risk. Likewise, it is not sensitive to those Threatened species that currently have increasing population trends, albeit not at a level to secure their being moved to a lower category of threat.

2.5 Global patterns of genuine changes

Global patterns of change in IUCN Red List status were mapped by quantifying the

number of genuine Red List category changes in each species' status, across all species in each hexagon. A change between two adjacent categories (e.g., if a previously Vulnerable species is moved to Endangered) counts as one, while changes between non-adjacent categories count as multiple steps (e.g., a change from Vulnerable to Critically Endangered counts as two steps). This assumes that a species' status is uniform across its range. The following parts of species' range maps have been excluded from this analysis: where the species is vagrant (polygons coded as Origin 4) or of uncertain origin (Origin = 5); where the species is introduced, except if such introduction was done for conservation purposes (e.g., translocation of Mauritius Fody *Foudia rubra* to predator-free Ile aux Aigrettes); where the species is possibly extant, but there are no known records (Presence = 3); where the species is coded as probably extinct (Presence = 4) or extinct (Presence = 5) if the species is improving in Red List status, because it is assumed that these are areas of previous decline where recovery has not yet occurred (e.g., most of the historical range of the Black-footed Ferret *Mustela nigripes*, outside the three small areas where it has established new populations subsequent to successful reintroduction programs); where a deteriorating species is coded as extinct (Presence = 5) if, and only if, such range contraction took place before the temporal period considered (e.g., before 1980 for amphibians); and where the species' seasonal occurrence is uncertain (Seasonality = 5).

To show global patterns of overall deterioration in status (Fig S5A), we considered only the number of negative Red List category changes, while for patterns of improvement (Fig S5B) we counted only the number of positive Red List category changes. To determine net change in Red List status (Fig 4), we considered both the number of negative and positive changes per cell. A value of zero may therefore indicate either no change in any of the species in the cell or that negative changes were offset exactly by positive ones. In order to combine results for different taxa, the values in each cell represent the number of genuine Red List category changes per year rather than absolute number of changes. Hence, in each cell, the absolute number of Red List category changes for amphibians was divided by 24 years (1980 to 2004), in the birds by 20 (1988 to 2008) and in the mammals by 12 (1996 to 2008). These values per year were then summed across taxa to obtain the total number of Red List category changes averaged per year, across birds, mammals and amphibians.

Note that improvements have not necessarily occurred across the entire historical range of a species. The Black-footed Ferret *Mustela nigripes*, for example, formerly widespread throughout the Great Plains of west-central North America, now is limited to 18 reintroduction sites in the wild. Conversely, in some migratory species with broad cosmopolitan distributions (e.g., marine mammals), improvements have been more widespread. This accounts for the homogenous pattern evident at sea in the maps showing global patterns of improvements (Fig 4, S5B).

2.6 Estimating the impact of conservation action

In our analysis of the estimation of conservation impact, we followed an approach that does not aim to measure the full impact of conservation action, but simply to show that

conservation makes a visible difference in global trends in species conservation status. It is focussed on a very particular set of species: those which have demonstrably improved in conservation status (as measured by change in IUCN Red List category over time) and for which we are confident that such improvement was due to conservation action. In Figure 3, we compare the RLI trends as observed across all species (black line) with the RLI trends that would be expected if those species that improved in status due to conservation action had instead remained unchanged in their original Red List category (red line). The difference between the two is attributable to conservation action because we are confident that 64 of the 68 species that improved would not have done so without such action. Consequently, the difference between trends shows that past conservation efforts have made a visible difference in the RLI trends.

An alternative approach to exploring the question of whether conservation action made a difference to the observed trends in conservation status, would be to divide all species into two groups – those for which conservation action has been implemented and those for which it hasn't – and to compare the resulting trends in their conservation status. We were not able to use this approach, because we do not have a reliable list of species for which we can conclusively say that conservation action is *not* in place. Indeed, although the Red List does include information on conservation actions currently known to be in place, this information is incomplete. However, even if we could reliably subset species into those for which conservation action is in place and those for which it is not, the difference between their respective RLIs would not necessarily be a measure of the impact of conservation because conserved species are often a biased subset of the whole. For example, widespread species are more likely to benefit from conservation action somewhere in their range than are restricted-range species, and tropical species are more likely to occur in economically poorer and biodiversity richer countries where they are likely to receive less attention.

As we emphasize in the main text, our estimates of the impact of conservation are an underestimate and need to bear certain caveats in mind. An explicit assumption in our analysis is that the 64 species that improved in status due to conservation action would have remained at least unchanged in their Red List category if those actions had not been implemented. In fact, this is a conservative assumption because it is reasonable to expect that some of these species would have deteriorated further (*sensu* S57), thereby contributing to the slope of the RLI being even greater. Furthermore, it should not be misconstrued that the remaining 864 cases of deterioration were not the focus of conservation actions. In fact, many were, but such actions either were insufficient, and/or inappropriate, and /or the driver may be unknown such that the major threats could not be offset, and/or there may be a lag effect before the impact of conservation is reflected in a change in category. Unfortunately, we have no information, nor context, on these reasons for each species that deteriorated, although general observations are possible (for example, we know that although protected areas are in place in many parts of Southeast Asia, actual management and enforcement are lacking thereby contributing much to the decline of many large-bodied species in the region). However, conversely, neither do we have any information on whether these conservation actions prevented what would otherwise have been a more rapid deterioration, i.e., might those species that

underwent a deterioration have deteriorated faster were it not for conservation (see next paragraph).

We remark on two primary explanations for why our estimates under-represent true impact. As suggested above, the most important of these is that we made no attempt to quantify where species would have deteriorated further (or even gone extinct) in the absence of conservation efforts, even if they remained in their current category. An analysis based on information on population sizes, trends, threatening processes and the nature and intensity of conservation actions implemented for Critically Endangered birds during 1994–2004, found that 16 bird species would have probably become extinct during this period if conservation programmes for them had not been undertaken (S57). Theoretically, we could supplement these data into our results on conservation impact for the bird RLI (Fig 3B), which would result in a marginally steeper slope. However, our objective was only to present a minimum estimate. Practically, to more appropriately estimate conservation impact, the analysis for Critically Endangered birds would need to be extended not just to other taxa, but indeed to all categories of threat. This in turn introduces complexities not just associated with determining whether or not a species would have deteriorated in status in the absence of conservation, but *how much* it would have deteriorated (one category, two categories etc). Nonetheless, this is an area ripe for further investigation.

2.7 Drivers of genuine change in IUCN Red List status

For each species that underwent a genuine change in IUCN Red List category, the primary driver of the change in category (either the threat, for deteriorating species, or threats mitigated by conservation actions, in the case of improving species) was identified following the approach developed by (S58) and (S59). Information was extracted from BirdLife International and IUCN datasets on population size and trend, range size and trend, ecology, life history, threats (including, for birds, threat magnitude, timing, scope, severity and stresses), and conservation actions implemented and underway (all of which are synthesized in the World Bird Database, and summarized in the published species factsheets at <http://www.birdlife.org/datazone/species/index.html> for birds, and in IUCN’s Species Information Service and factsheets available at www.iucnredlist.org for mammals and amphibians), including the data sources, unpublished literature and correspondence underpinning the published Red List assessments.

Both current information and earlier assessments were examined. For each genuine category change, the parameter that increased or decreased sufficiently to cross a Red List category threshold was identified (e.g., the population size fell below 250 mature individuals, the number of locations increased to six owing to successful establishment of a translocated population, etc.). Then, for the specific parameter for each species, the primary driver of change (threat, or threat mitigated) was categorized following the IUCN/CMP classification scheme for threats (see <http://www.iucnredlist.org/technical-documents/classification-schemes/threats-classification-scheme-ver3>). Note that “logging” includes harvesting of trees and/ or other woody vegetation for timber, fibre or

fuel (e.g., commercial logging, firewood collection), and “hunting/trapping” and “fisheries” account for both direct persecution (e.g., for pest control) or incidental mortality (e.g., fisheries by-catch). Following the methodology of (S58), the chytrid fungus is treated as an invasive alien species in the Americas, Australia and New Zealand and native elsewhere, although it may prove to be introduced rather than native in Africa and Europe too.

Primary threats were defined as those believed to have caused the majority (i.e. $\geq 50\%$) of the decline/improvement (as measured by the change in the population or range parameter that crossed the relevant Red List category threshold). For the majority of species, there was only one primary threat, but for a few species (2 birds; 7 mammals; 3 amphibians) there were two of equal importance and hence these were both coded as primary. Secondary threats (those believed to have caused 10-49% of the decline/improvement) were also recorded, including, if possible, the most important (indicated by an asterisk in Table S6). For 48 amphibians, there was no primary threat, and instead a combination of several secondary threats was coded. For the purposes of the current analysis, only primary threats were analysed.

2.8 Actions leading to improvement in IUCN Red List status

In addition to coding drivers of change in IUCN Red List category, we also coded up major and minor actions leading to status improvements in mammals, birds and amphibians (Table S8). As with threats, these were categorized using the IUCN/CMP classification scheme for conservation actions (see <http://www.iucnredlist.org/technical-documents/classification-schemes/conservation-actions-classification-scheme-ver2>). For the purpose of analysis, we combined these as follows (numbers in parentheses refer to the corresponding threat code in IUCN’s Species Information Service): Land/water protection (1.1 and 1.2); Site/Area management (incl. 2.1 and 2.3 habitat and natural process restoration); Invasive species control (2.2); Species management / species recovery (3.1.3 and 3.2); Harvest / trade management (3.1.1. and 3.1.2); reintroduction / ex situ conservation (3.3 and 3.4); Education and awareness (4); Law and policy (5); Livelihoods, etc (6). Note that “invasive species control” also includes control of problematic native species.

2.9 Conservation actions required

To identify those conservations deemed required for all Critically Endangered species (Fig S10), we queried the conservation actions classification scheme for all actions proposed. As with 2.8, for the purpose of analysis we combined these as follows (numbers in parentheses refer to the corresponding threat code in IUCN’s Species Information Service): Land/water protection (1.1 and 1.2); Site/Area management (incl. 2.1 and 2.3 habitat and natural process restoration); Invasive species control (2.2); Species management / species recovery (3.1.3 and 3.2); Harvest / trade management (3.1.1. and 3.1.2); reintroduction / ex situ conservation (3.3 and 3.4); Education and awareness (4); Law and policy (5); Livelihoods, etc (6). Note that in this analysis only,

“invasive species control” also includes control of problematic native species.

3 Figures and legends

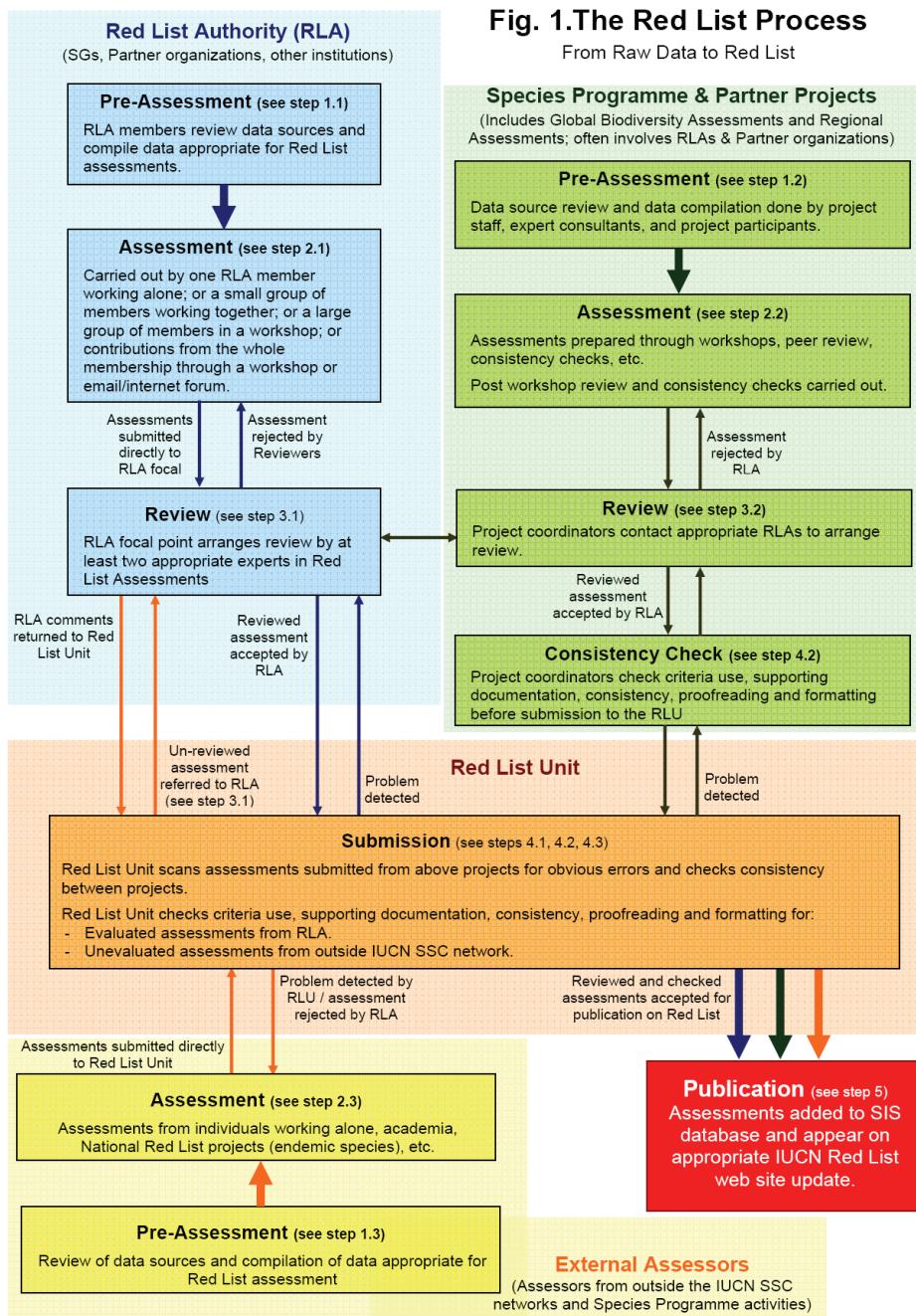


Fig S1. Schematic representation of the IUCN Red List assessment process

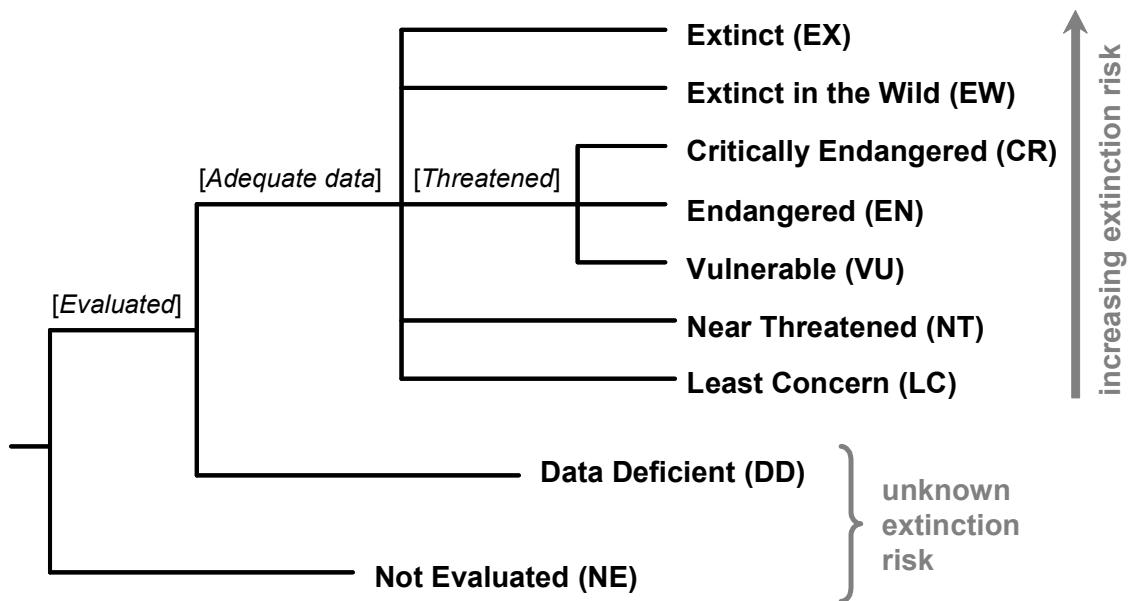
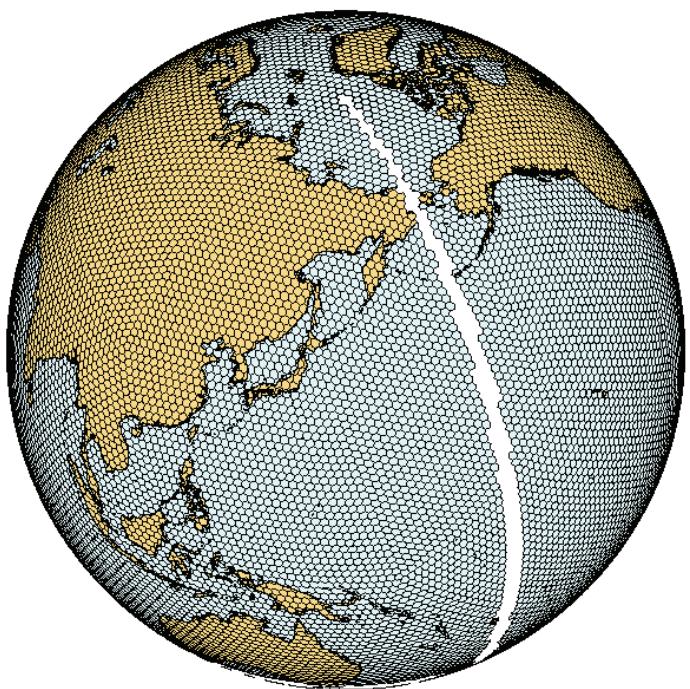


Fig S2. The IUCN Red List Categories. Categories Least Concern through Extinct are termed categories of threat. Adapted, with permission, from (S30).

A



B

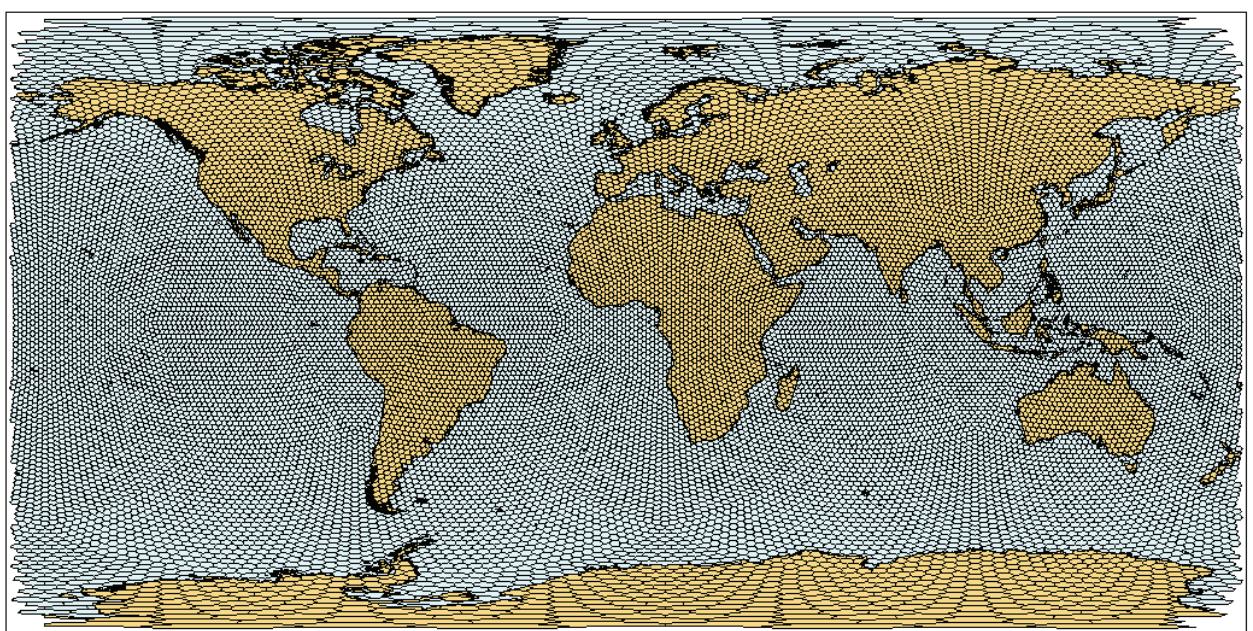


Fig S3. Hexagonal grid used in the spatial analysis: A) viewed on a globe; B) on a cylindrical projection. Cells near 180°E/W were excluded.

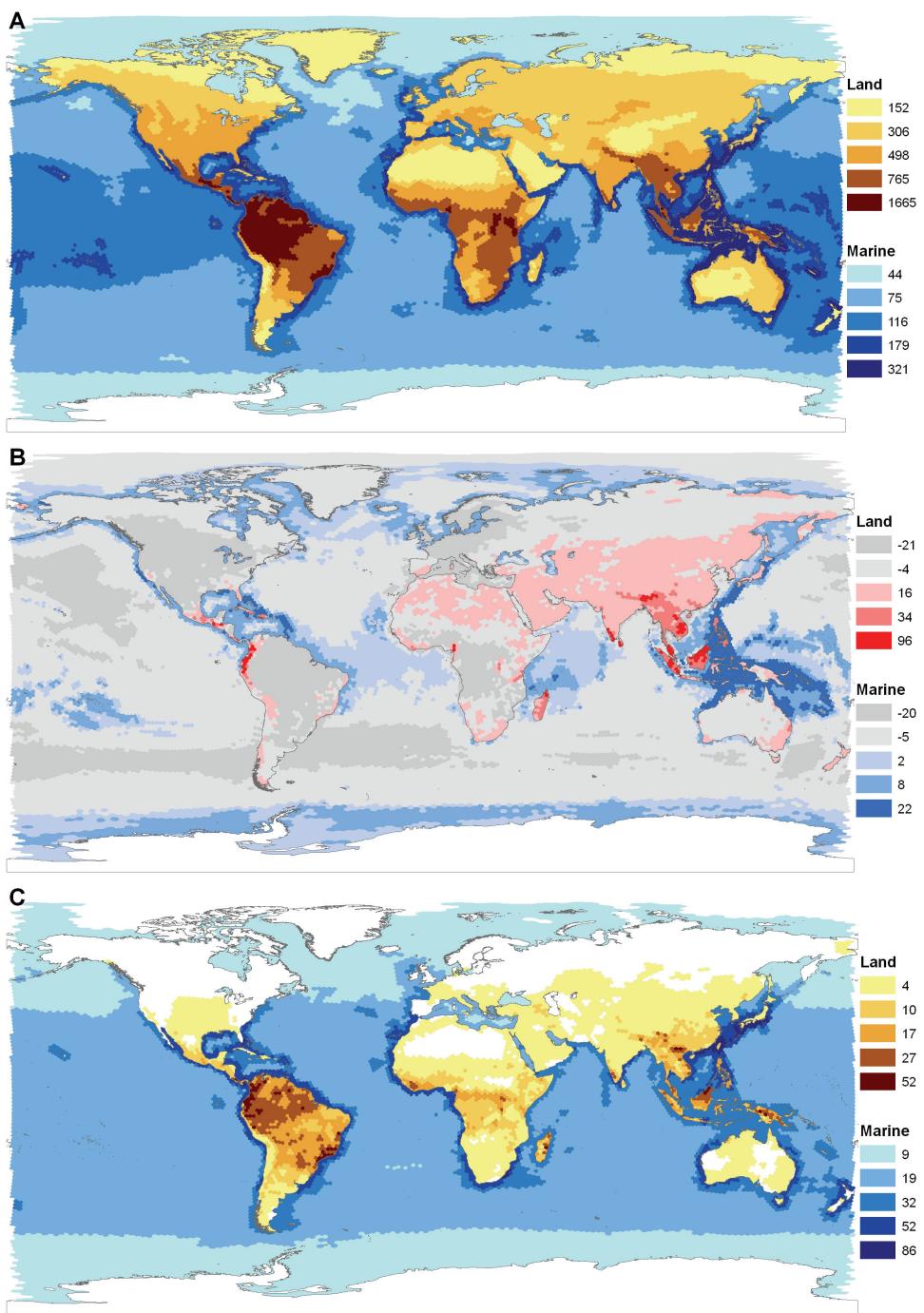


Fig S4. Global patterns of vertebrate diversity, for land (terrestrial and freshwater, in brown) and marine (in blue) vertebrates. (A) Total number of species. (B) Residuals of the relationship between total number of species and total number of Threatened species per cell, where positive values (red) represent cells with higher threat than expected for their richness alone, and negative values (gray) represent cells with equal or lower threat than expected for richness alone. (C) Data Deficient species.

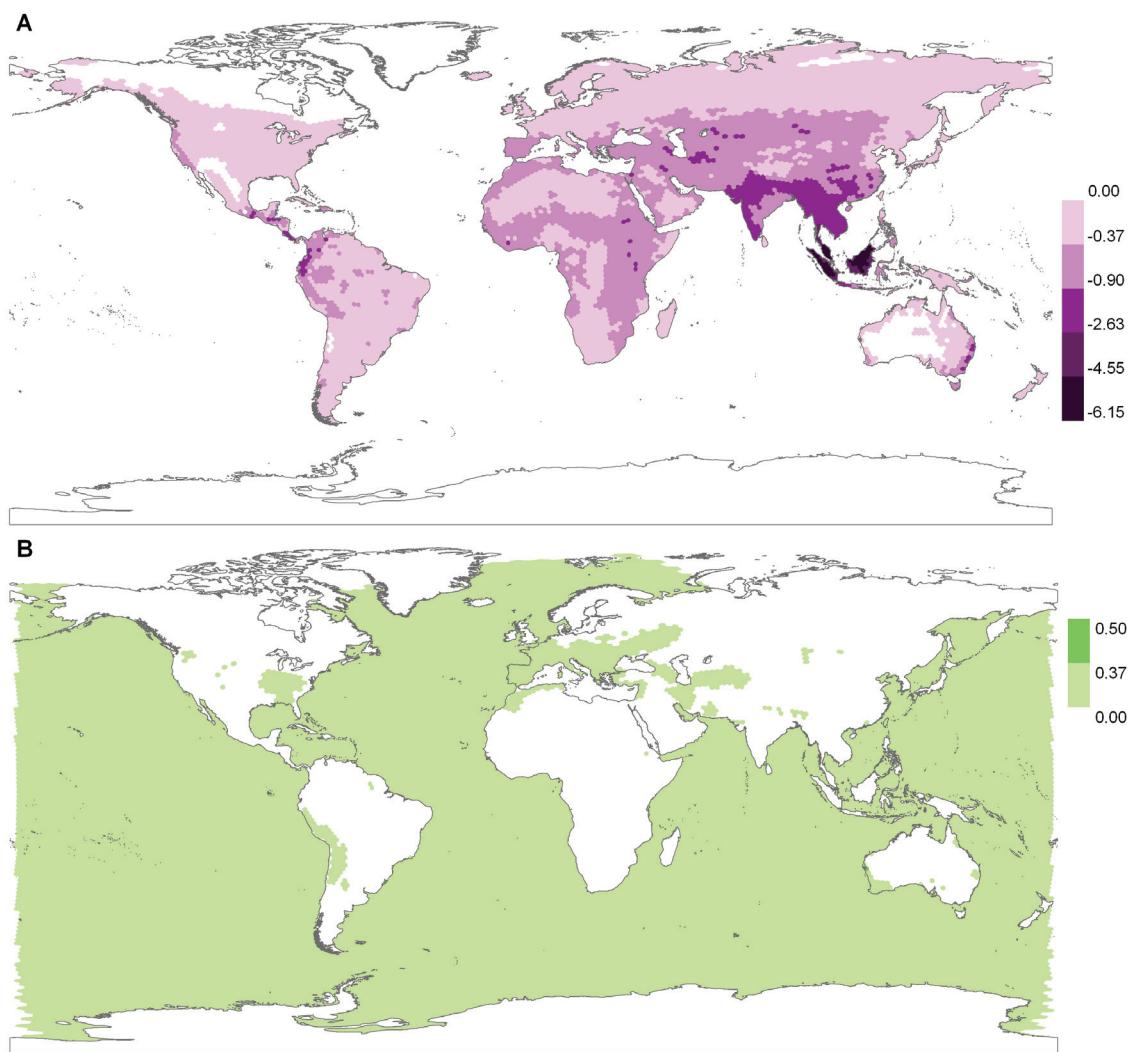


Fig S5. Global patterns of change in overall extinction risk across birds, mammals and amphibians (for the periods plotted in Fig 3) mapped as average number of genuine Red List category changes per cell per year. (A) Deteriorations (i.e., increasing extinction risk). (B) Improvements (i.e. decreasing extinction risk). In B, the uniform pattern of improvement at sea is driven by improvements of migratory marine mammals with cosmopolitan distributions (e.g., Humpback Whale). Deteriorations (e.g., Nightingale Reed-warbler *Acrocephalus luscinius* in the Northern Mariana Islands) and improvements (e.g., Rarotonga Monarch *Pomarea dimidiata* in the Cook Islands) on islands are hard to discern.

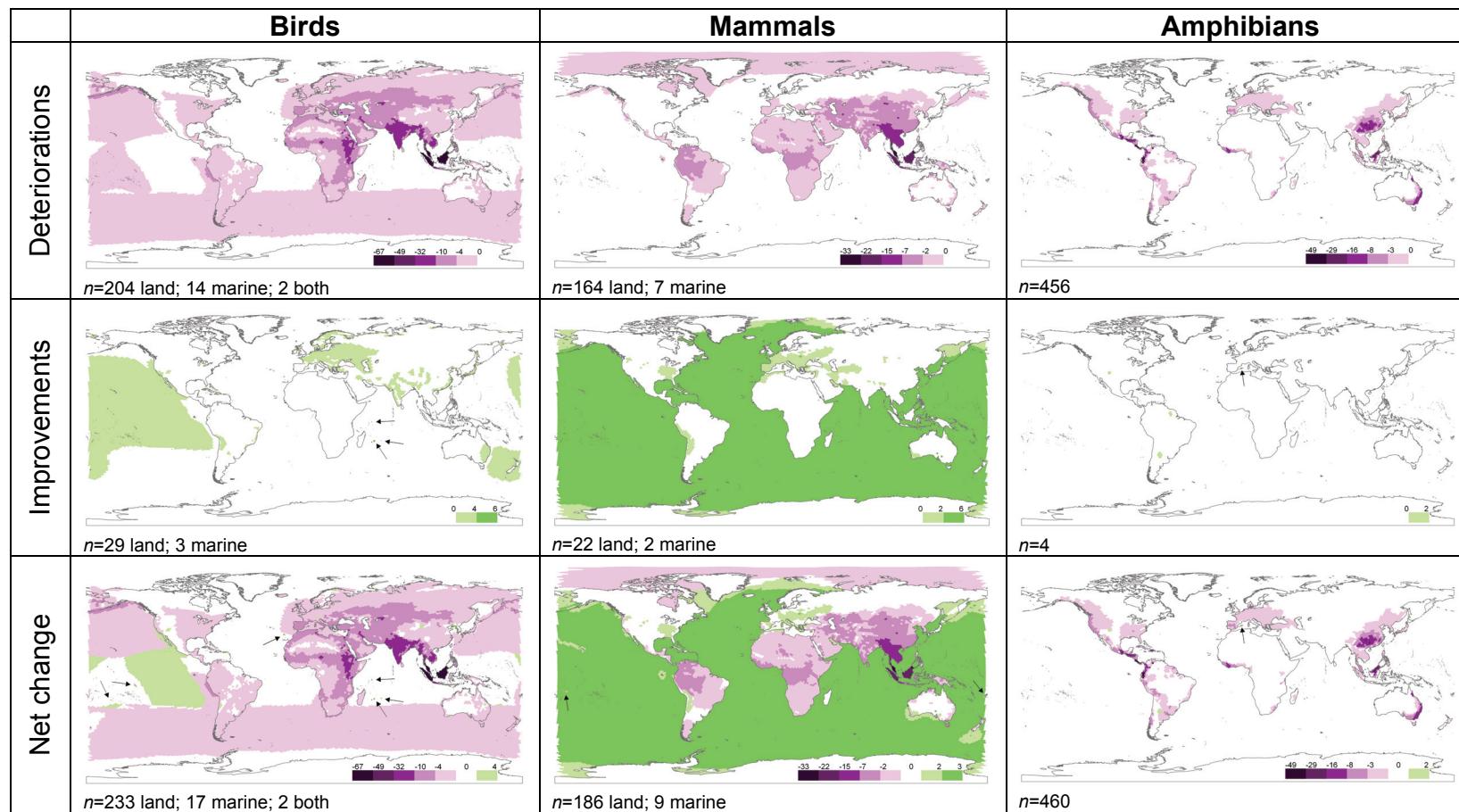


Fig S6. Global patterns of change in overall extinction risk across each of birds, mammals and amphibians (for the periods plotted in Fig 3) mapped as absolute number of genuine Red List category changes per cell. (i) Deteriorations (i.e., increasing extinction risk). (ii) Improvements (i.e. decreasing extinction risk). (iii) Net changes, where purple shades correspond to deterioration in extinction risk in that cell, green to improvement, and white to no change. Arrows point to improvements on islands. *n* denotes number of species undergoing a genuine change (see Table S6).

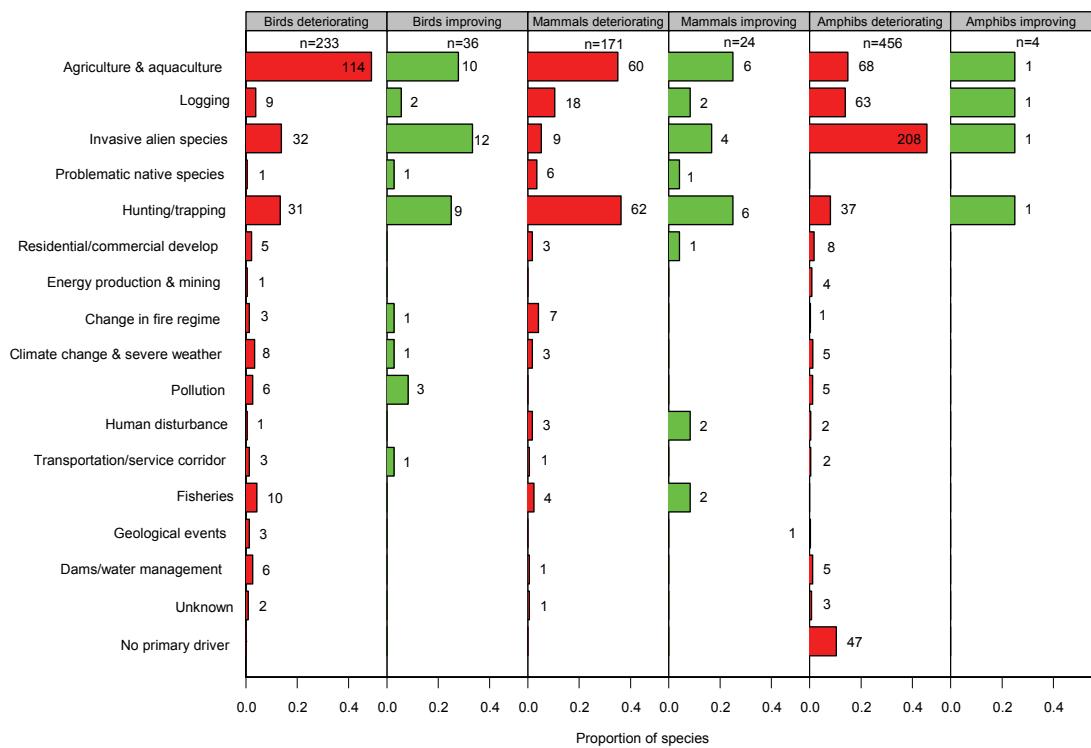


Fig S7. Proportion of bird, mammal and amphibian species qualifying for genuine Red List category changes owing to the impacts of particular threats (primary drivers of the change in status), including threats leading to deterioration in status (red) and threats mitigated by conservation leading to improvements in status (green). *n* denotes number of species improving or deteriorating (excludes the 4 bird species that improved in status not owing to conservation). As noted elsewhere, 2 birds, 7 mammals and 3 amphibians had two threats of equal importance and hence these were both coded as primary drivers.

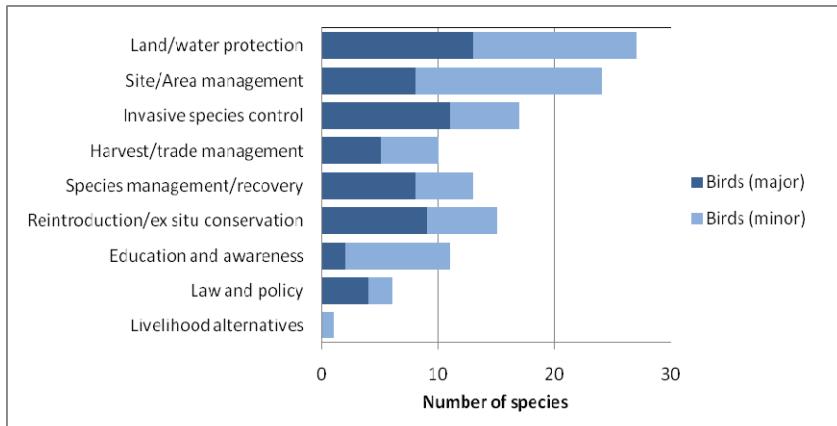
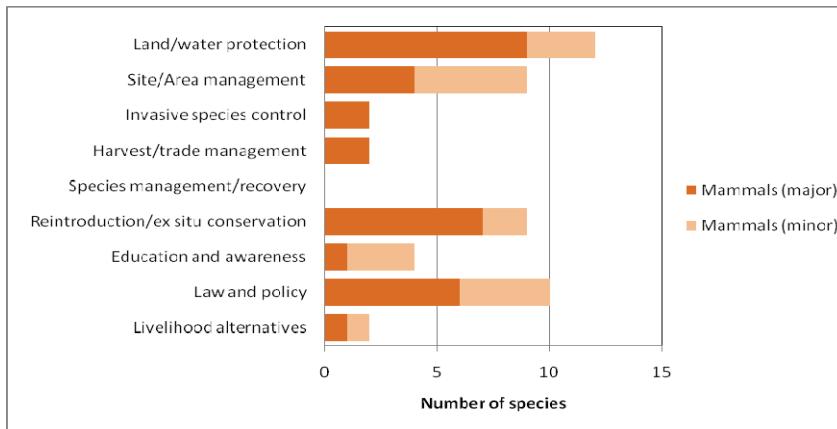
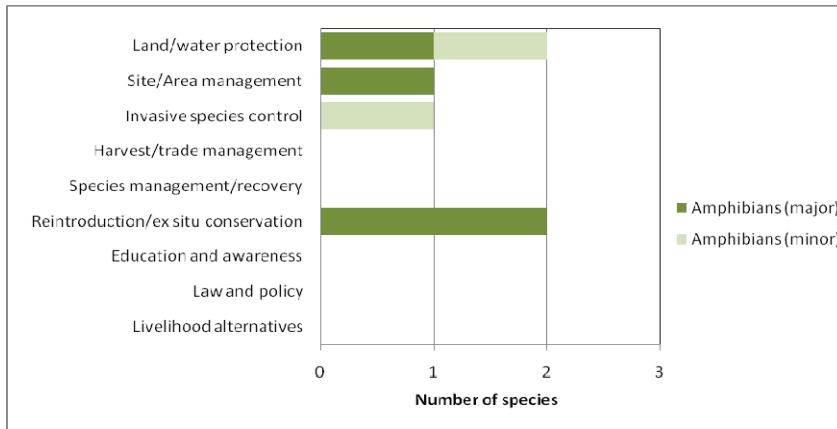
A.**B.****C.**

Fig S8. Conservation actions implemented that led to improvements in IUCN Red List status for (A) Birds, (B) Mammals, and (C) Amphibians.

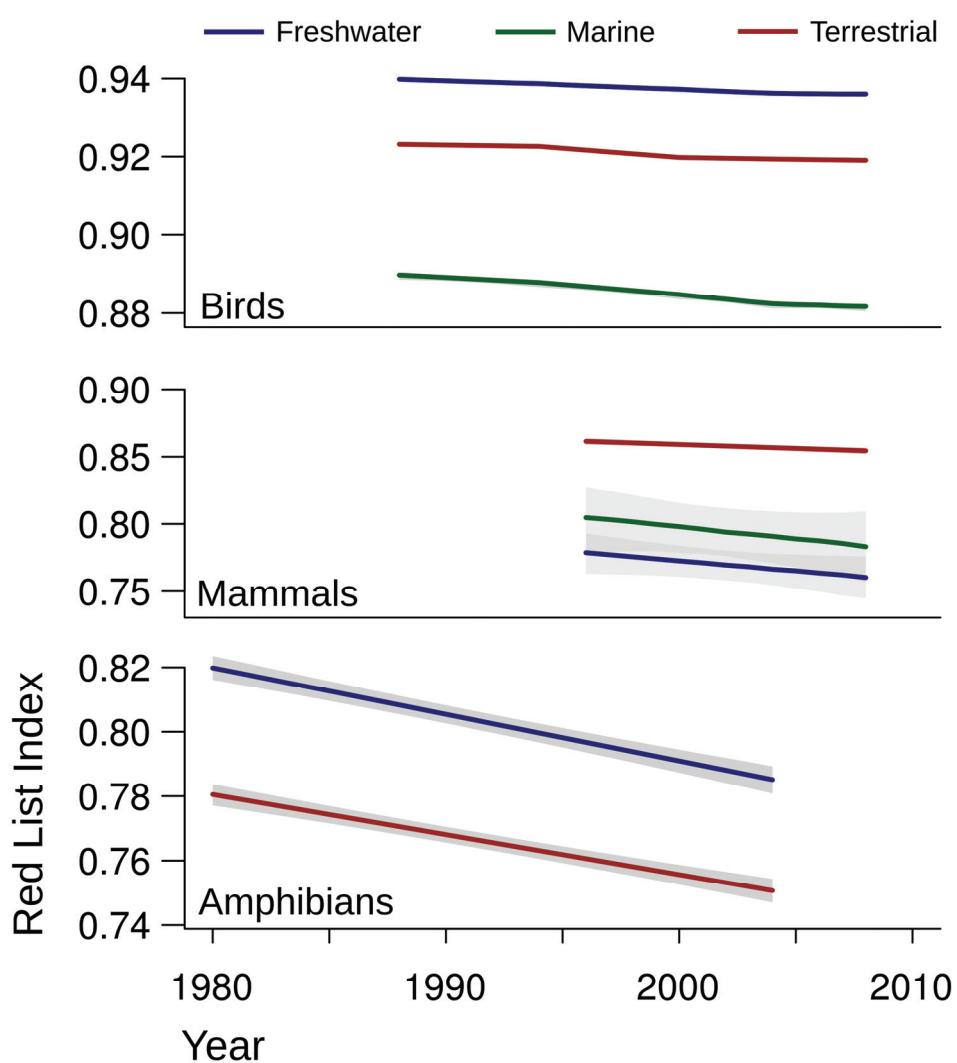


Fig S9. IUCN Red List Index for all birds, mammals and amphibians in freshwater, marine and terrestrial systems. Shading shows 95% confidence intervals.

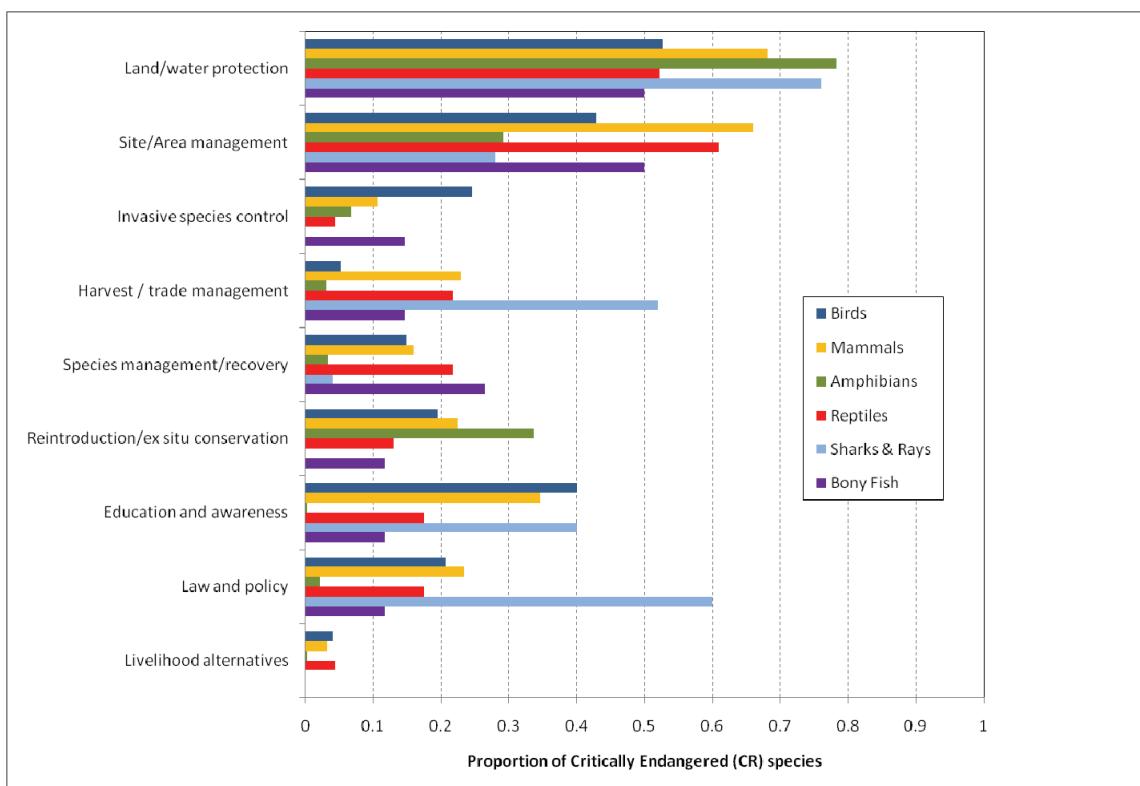


Fig S10. Conservation actions urgently needed for Critically Endangered vertebrates.

4 Tables and legends

Table S1. Number of currently recognized species in each major class of vertebrates and the taxonomic source followed. Numbers include recently extinct species (i.e., since 1500). Asterisks denote sampled groups. Differences in numbers between described and assessed species for completely assessed groups are because of divergences in taxonomy or a lag effect in assessing recently described species (see section 1.4).

Class	Number of species formally described (number assessed)	Taxonomic source
Mammalia (mammals)	5,498 (5,489)	(60, 61)
Aves (birds)	10,027 (10,027)	(62)
Amphibia (amphibians)	6,638 (6,284)	(63)
Reptilia (reptiles)	9,084 (1,500)*	(64)
Chondrichthyes (cartilaginous fishes)	1,168 (1,044)	(65) [Note: includes many undescribed species]
Actinopterygii, Cephalaspidomorpha, Sarcopterygii (bony fishes)	29,930 (1,436)*	(66)
Total	62,345 (25,780)	

Table S2. Number of species in each IUCN Red List category and proportion of species Threatened for all vertebrates and all completely or randomly assessed non-vertebrate and plant groups. IUCN Red List Categories: EX, Extinct; EW, Extinct in the Wild; CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NR, Near Threatened; LC, Least Concern; DD, Data Deficient. Threatened includes species in categories Vulnerable, Endangered and Critically Endangered. Numbers in parentheses represent total numbers of species in the group assessed including EX; asterisks indicate those groups in which estimates are derived from a randomized sampling approach.

IUCN Red List category	Mammals (5,489)	Birds (10,027)	Amphibians (6,284)	Cartilaginous fishes (1,044)	Reptiles* (1,500)	Bony fishes* (1,436)	Dragonflies* (1,498)	Freshwater crabs (1,280)	Freshwater crayfish (589)	Corals (845)	Conifers (619)	Cycads (303)	Seagrasses (72)
EX	76	132	37							4			
EW	2	4	2						0			4	
CR	188	190	484	25	28	34	24	34	49	5	20	51	0
EN	450	372	754	42	108	35	41	53	62	25	54	64	3
VU	492	678	657	114	133	102	57	116	31	201	97	74	7
NT	325	838	382	134	70	34	64	18	46	175	88	62	5
LC	3121	7751	2371	241	873	934	785	428	262	297	334	45	48
DD	835	62	1597	488	288	297	527	631	136	142	26	3	9
LC+NT	3446	8589	2753	375	943	968	849	446	308	472	422	107	53
Total Extant Assessed	5413	9895	6247	1044	1500	1436	1498	1280	586	845	619	303	72
Threatened/Extant Assessed	21%	13%	30%	17%	18%	12%	8%	16%	24%	27%	28%	62%	14%
Threatened/(Extant Assessed-DD)	25%	13%	41%	33%	22%	15%	13%	31%	32%	33%	29%	63%	16%
(Threatened+DD)/Extant Assessed	36%	13%	56%	64%	37%	33%	43%	65%	47%	44%	32%	63%	26%
Proportion of Extant Assessed as DD	15%	1%	26%	47%	19%	21%	35%	49%	23%	17%	4%	1%	13%

Table S3 Calculation of total proportion (weighted) of all vertebrate species classified as Threatened (Vulnerable, Endangered and Critically Endangered).

	Completely assessed				Sampled			
	<i>Mammals</i>	<i>Birds</i>	<i>Amphibians</i>	<i>Cartilaginous fishes</i>	<i>Reptiles</i>	<i>Bony fishes</i>	Total	Proportion
Total species	5489	10027	6284	1044	9084	29930	61858	
Total extant species	5413	9895	6247	1044	9084	29930	61613	
Total extant assessed	5413	9895	6247	1044	1500	1436	25535	
<i>Estimated total number of Threatened species, based on percentages in Table S2:</i>								
Threatened/Extant assessed	1130	1241	1896	181	1629	3564	9640	16%
Threatened/(Extant assessed-DD)	1337	1248	2547	340	2016	4493	11981	19%
(Threatened+DD)/Extant assessed	1966	1303	3493	669	3373	9754	20558	33%

Table S4. The decline in the Red List Index over the relevant time period for birds, mammals and amphibians, demonstrating the difference including and excluding conservation-driven improvements.

	Net %RLI decline (A)	%RLI decline excluding improvements (B)	Reduction in %RLI decline resulting from improvements (B - A)	% RLI decline prevented by improvements ((B - A)/A)
Birds (1988-2008)	0.492	0.579	0.086	17.5
Mammals (1996-2008)	0.796	0.944	0.148	18.6
Amphibians (1980-2004)	3.406	3.454	0.047	1.4

Table S5. The number of species in IUCN Red List Categories for each assessment period as used for calculating the IUCN Red List Index. EX, Extinct; CR(PE), Critically Endangered (Possibly Extinct); EW, Extinct in the Wild; CR(PEW), Critically Endangered (Possibly Extinct in the Wild); CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NR, Near Threatened; LC, Least Concern; DD, Data Deficient.

	IUCN Red List category									
	EX	CR(PE)	EW	CR(PEW)	CR, excl PE/PEW	EN	VU	NT	LC	DD
Birds (updated 2010)										
1988	130	7	3	0	166	338	681	801	7839	62
1994	132	11	3	0	164	343	678	801	7833	62
2000	132	12	3	0	173	356	689	841	7759	62
2004	132	12	4	1	170	375	680	836	7755	62
2008	132	13	4	1	176	372	678	838	7751	62
Mammals (updated 2010)										
1996	76	21	3	0	138	435	485	340	3155	834
2008	76	24	2	0	164	449	492	326	3120	834
Amphibians										
1980	25	19	0	0	203	775	689	321	2367	1344
2004	34	95	1	0	301	723	626	358	2244	1337

Table S6. Species showing genuine change in IUCN Red List status and the drivers of genuine change or the threat mitigated by conservation action (1=primary; 2=secondary; 2* = most important secondary). “No. cats changed” = total number of step-wise category changes; Up/down = whether the species underwent an overall improvement (leading to the species moving to a lower category of threat, “down”) or deterioration (leading to the species moving to a higher category of threat, “up”) in status; “Period” = the time period over which the change in status applies. IUCN Red List category abbreviations: EX, Extinct; CR(PE), Critically Endangered (Possibly Extinct); EW, Extinct in the Wild; CR(PEW), Critically Endangered (Possibly Extinct in the Wild); CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern; DD, Data Deficient. Numbers in parentheses after drivers correspond to (S3I). Legend for current population trend: ↓=decreasing; ↑=increasing; ←=stable; and ?=unknown (23 species that previously underwent a genuine deterioration have increasing or stable trends). Note that many well-documented conservation successes are excluded, because their improvements took place before the time-periods considered here (e.g., Arabian Oryx *Oryx leucoryx*, Extinct in the Wild mid-1970s, reintroduced 1990, currently Endangered, although eligible for listing as Vulnerable in 2011; and White Rhinoceros *Ceratotherium simum*, Critically Endangered start of 20th Century at ~20-50 individuals, currently Near Threatened at ~17,500 in 2007).

Class	Sci name	Driver of genuine change, or threat mitigated by action (1 = primary; 2 = secondary; 2* = most important secondary)																							
		No. cats changed	Up/down	Down owing to conservation?	Period	Category at start of period	Category at end of period	Agriculture & aquaculture (2)	Logging (5.3)	Invasive species (8.1)	Native species (8.2)	Hunting/trapping (5.2)	Residential & commercial development (1)	Energy production & mining (3)	Change in fire regime (7.1)	Climate change & severe weather (11)	Pollution (9)	Human disturbance (6)	Transportation & service corridors (4)	Fisheries (5.4)	Geological events (10)	Dams/water management (7.2)	Non-timber biological resource use	Unknown	Not possible to assign primary
Amphibia	<i>Adelotus brevis</i>	1	u		80-04	LC	NT	2	Logging (5.3)	1			2									y	↓		
Amphibia	<i>Afrixalus nigeriensis</i>	1	u		80-04	LC	NT	2	2				2									y	y	↓	
Amphibia	<i>Afrixalus spinifrons</i>	1	u		80-04	NT	VU	1					2*				2						↓		
Amphibia	<i>Agalychnis annae</i>	2	u		80-04	NT	EN			1		2*											↓		
Amphibia	<i>Agalychnis litodryas</i>	2	u		80-04	LC	VU	1	2*				2										↓		
Amphibia	<i>Agalychnis moreletii</i>	4	u		80-04	LC	CR	2*		1													↓		

Amphibia	<i>Agalychnis saltator</i>	1	u		80-04	LC	NT	1	2*																	↓
Amphibia	<i>Albericus siegfriedi</i>	2	u		80-04	VU	CR										1	2*								↓
Amphibia	<i>Alsodes barrioii</i>	1	u		80-04	NT	VU	1																		↓
Amphibia	<i>Alsodes montanus</i>	2	u		80-04	VU	CR							1					2*							↓
Amphibia	<i>Alsodes tumultuosus</i>	2	u		80-04	VU	CR							1					2*							↓
Amphibia	<i>Alsodes vanzolinii</i>	2	u		80-04	VU	CR	1						2*												↓
Amphibia	<i>Alytes cisternasii</i>	1	u		80-04	LC	NT	1	2				2					2			2			y	↓	
Amphibia	<i>Alytes dickhilleni</i>	1	u		80-04	NT	VU	2										2			2			y	y	↓
Amphibia	<i>Alytes muletensis</i>	2	d	y	80-04	CR	VU			1			2								2*					↑
Amphibia	<i>Ambystoma andersoni</i>	2	u		80-04	VU	CR						1					2*								↓
Amphibia	<i>Ambystoma barbouri</i>	1	u		80-04	LC	NT	1					2*													↓
Amphibia	<i>Ambystoma bombyvellum</i>	2	u		80-04	VU	CR	1	2									2*								↓
Amphibia	<i>Ambystoma dumerilii</i>	2	u		80-04	VU	CR						1					2*								↓
Amphibia	<i>Ambystoma leorae</i>	2	u		80-04	VU	CR	2*	2				2					1								↓
Amphibia	<i>Ambystoma taylori</i>	2	u		80-04	VU	CR										2*				1					↓
Amphibia	<i>Amniranra occidentalis</i>	1	u		80-04	VU	EN	2	2				2											y	y	↓
Amphibia	<i>Amolops lolensis</i>	1	u		80-04	NT	VU						1				2*									↓
Amphibia	<i>Andinophryne colomai</i>	2	u		80-04	EN	CR(PE)	1	2*									2								↓
Amphibia	<i>Andrias davidianus</i>	3	u		80-04	NT	CR						1													↓
Amphibia	<i>Aneides aeneus</i>	1	u		80-04	LC	NT	2*	1								2									↓
Amphibia	<i>Aneides ferreus</i>	1	u		80-04	LC	NT		1																	↓
Amphibia	<i>Ansonia albomaculata</i>	1	u		80-04	LC	NT	1									2*									↓
Amphibia	<i>Ansonia hanitschi</i>	1	u		80-04	LC	NT	2*	1								2									↓
Amphibia	<i>Ansonia leptopus</i>	1	u		80-04	LC	NT	2*	1								2									↓
Amphibia	<i>Ansonia longidigita</i>	1	u		80-04	LC	NT	2*	1								2									↓
Amphibia	<i>Ansonia spinulifer</i>	1	u		80-04	LC	NT	2*	1								2									↓
Amphibia	<i>Argenteohyla siemersi</i>	3	u		80-04	LC	EN	1									2*		2							↓
Amphibia	<i>Aromobates nocturnus</i>	2	u		80-04	VU	CR	2*	1									2								↓
Amphibia	<i>Arthroleptella ngongoniensis</i>	1	u		80-04	EN	CR	1	2*								2									↓
Amphibia	<i>Arthroleptis crusculum</i>	1	u		80-04	VU	EN	2*									1									↓
Amphibia	<i>Arthroleptis troglodytes</i>	2	u		80-	VU	CR										1					2*				↓

			04																							
Amphibia	<i>Atelognathus patagonicus</i>	1	u		80-04	VU	EN		1									2*								↓
Amphibia	<i>Atelognathus praebasalticus</i>	2	u		80-04	NT	EN	2*	1																	↓
Amphibia	<i>Atelopus andinus</i>	3	u		80-04	NT	CR		1																→	
Amphibia	<i>Atelopus angelito</i>	2	u		80-04	VU	CR		1																↓	
Amphibia	<i>Atelopus arsyecue</i>	1	u		80-04	EN	CR	2	2	1								2							y ?	
Amphibia	<i>Atelopus arthuri</i>	2	u		80-04	EN	CR(PE)	2	2	1				2				2							y ↓	
Amphibia	<i>Atelopus balios</i>	2	u		80-04	EN	CR(PE)	2	2	1								2							↓	
Amphibia	<i>Atelopus bomolochos</i>	2	u		80-04	VU	CR		1																↓	
Amphibia	<i>Atelopus boulengeri</i>	1	u		80-04	EN	CR	2*		1			2	2				2							↓	
Amphibia	<i>Atelopus carauta</i>	1	u		80-04	EN	CR	2*		1															↓	
Amphibia	<i>Atelopus carbonerensis</i>	3	u		80-04	VU	CR(PE)	2	2	1								2							y ↓	
Amphibia	<i>Atelopus carrikeri</i>	1	u		80-04	EN	CR	2		1								2	2						y ↓	
Amphibia	<i>Atelopus certus</i>	1	u		80-04	VU	EN	2*		1								2							?	
Amphibia	<i>Atelopus chiriquiensis</i>	3	u		80-04	VU	CR(PE)	2*		1															↓	
Amphibia	<i>Atelopus choocoensis</i>	1	u		80-04	EN	CR	2*	2	1															?	
Amphibia	<i>Atelopus chrysocorallus</i>	3	u		80-04	VU	CR(PE)	2*	2	1															↓	
Amphibia	<i>Atelopus coynei</i>	2	u		80-04	EN	CR(PE)	2*	2	1															↓	
Amphibia	<i>Atelopus cruciger</i>	2	u		80-04	VU	CR			1															↓	
Amphibia	<i>Atelopus ebenoides</i>	1	u		80-04	EN	CR	2*		1								2							↓	
Amphibia	<i>Atelopus elegans</i>	2	u		80-04	VU	CR	2*	2	1				2											↓	
Amphibia	<i>Atelopus erythrops</i>	2	u		80-04	VU	CR			1															↓	
Amphibia	<i>Atelopus eusebianus</i>	1	u		80-04	EN	CR			1															↓	
Amphibia	<i>Atelopus exiguus</i>	1	u		80-04	EN	CR	2*		1								2							?	
Amphibia	<i>Atelopus famelicus</i>	1	u		80-04	EN	CR	2*		1								2							↓	
Amphibia	<i>Atelopus farci</i>	2	u		80-04	VU	CR	2*		1			2												↓	
Amphibia	<i>Atelopus flavescens</i>	2	u		80-04	LC	VU	2*	2	1														→		
Amphibia	<i>Atelopus franciscus</i>	2	u		80-04	LC	VU			1														→		
Amphibia	<i>Atelopus galactogaster</i>	2	u		80-04	VU	CR			1															?	
Amphibia	<i>Atelopus glyphus</i>	2	u		80-04	VU	CR	2*	2	1				2				2							?	
Amphibia	<i>Atelopus guanujo</i>	3	u		80-04	VU	CR(PE)	2*	2	1				2											↓	

Amphibia	<i>Atelopus guittaraensis</i>	2	u		80-04	VU	CR			1					2*									?
Amphibia	<i>Atelopus halithelos</i>	2	u		80-04	VU	CR	2*	2	1			2											↓
Amphibia	<i>Atelopus ignescens</i>	3	u		80-04	VU	EX			1														n/a
Amphibia	<i>Atelopus laetissimus</i>	1	u		80-04	EN	CR	2		1								2						?
Amphibia	<i>Atelopus limosus</i>	2	u		80-04	NT	EN	1					2				2						y	↓
Amphibia	<i>Atelopus longibrachius</i>	1	u		80-04	VU	EN	2*	2	1			2				2							↓
Amphibia	<i>Atelopus longirostris</i>	2	u		80-04	EN	EX	2	2	1			2				2						y	n/a
Amphibia	<i>Atelopus lozanoi</i>	2	u		80-04	VU	CR			1					2*									↓
Amphibia	<i>Atelopus lynchi</i>	2	u		80-04	EN	CR(PE)	2*	2	1			2				2							↓
Amphibia	<i>Atelopus mandingues</i>	2	u		80-04	VU	CR			1														?
Amphibia	<i>Atelopus mindoensis</i>	2	u		80-04	EN	CR(PE)	2*	2	1														↓
Amphibia	<i>Atelopus minutulus</i>	1	u		80-04	EN	CR	2*		1														↓
Amphibia	<i>Atelopus monohernandezii</i>	2	u		80-04	VU	CR			1														?
Amphibia	<i>Atelopus mucubajensis</i>	3	u		80-04	VU	CR(PE)	2		1			2				2						y	↓
Amphibia	<i>Atelopus muisca</i>	3	u		80-04	VU	CR(PE)	2*		1														↓
Amphibia	<i>Atelopus nahumae</i>	1	u		80-04	EN	CR	2	2	1								2					y	?
Amphibia	<i>Atelopus nanay</i>	3	u		80-04	VU	CR(PE)	2*	2	1			2											↓
Amphibia	<i>Atelopus nepiozomus</i>	1	u		80-04	EN	CR		2	1			2										y	?
Amphibia	<i>Atelopus nicefori</i>	2	u		80-04	VU	CR	2*		1														?
Amphibia	<i>Atelopus oxyrhynchus</i>	2	u		80-04	EN	CR(PE)	2*	2	1			2											↓
Amphibia	<i>Atelopus pachydermus</i>	2	u		80-04	EN	CR(PE)			1														↓
Amphibia	<i>Atelopus pedimarmoratus</i>	2	u		80-04	VU	CR	2*		1														?
Amphibia	<i>Atelopus peruensis</i>	3	u		80-04	NT	CR			1					2*									?
Amphibia	<i>Atelopus petriruizi</i>	2	u		80-04	VU	CR	2*		1														?
Amphibia	<i>Atelopus pictiventris</i>	1	u		80-04	EN	CR			1														?
Amphibia	<i>Atelopus pinangoi</i>	2	u		80-04	EN	CR(PE)	2	2	1												y	↓	
Amphibia	<i>Atelopus planispina</i>	2	u		80-04	EN	CR(PE)	2	2	1			2	2			2					y	↓	
Amphibia	<i>Atelopus pulcher</i>	1	u		80-04	EN	CR	2*		1														↓
Amphibia	<i>Atelopus quimbaya</i>	2	u		80-04	VU	CR			1														?
Amphibia	<i>Atelopus reticulatus</i>	2	u		80-04	VU	CR			1														↓
Amphibia	<i>Atelopus seminiferus</i>	1	u		80-	EN	CR			1														↓

				04																						
Amphibia	<i>Atelopus senex</i>	2	u		80-04	EN	CR(PE)			1															↓	
Amphibia	<i>Atelopus sernai</i>	1	u		80-04	EN	CR	2*		1									2						↓	
Amphibia	<i>Atelopus simulatus</i>	1	u		80-04	EN	CR	2*		1									2						↓	
Amphibia	<i>Atelopus sonsonensis</i>	1	u		80-04	EN	CR	2*		1									2						?	
Amphibia	<i>Atelopus sorianoei</i>	2	u		80-04	EN	CR(PE)		2*	1															↓	
Amphibia	<i>Atelopus spumarius</i>	2	u		80-04	LC	VU	2	2	1														y	↓	
Amphibia	<i>Atelopus spurrelli</i>	2	u		80-04	LC	VU	2	2	1					2				2						y	↓
Amphibia	<i>Atelopus subornatus</i>	1	u		80-04	EN	CR	2*		1									2						↓	
Amphibia	<i>Atelopus tamaense</i>	2	u		80-04	VU	CR			1															↓	
Amphibia	<i>Atelopus tricolor</i>	2	u		80-04	LC	VU	2*		1									2						↓	
Amphibia	<i>Atelopus varius</i>	3	u		80-04	NT	CR	2*		1															↓	
Amphibia	<i>Atelopus walkeri</i>	1	u		80-04	EN	CR	2*		1									2						?	
Amphibia	<i>Atelopus zeteki</i>	1	u		80-04	EN	CR			1															↓	
Amphibia	<i>Atopophryne syntomopus</i>	1	u		80-04	EN	CR	2*											1						↓	
Amphibia	<i>Astrochaperina novaebritanniae</i>	1	u		80-04	NT	VU		1																↓	
Amphibia	<i>Batrachophryne brachydactylus</i>	2	u		80-04	NT	EN								1										↓	
Amphibia	<i>Batrachophryne macrostomus</i>	1	u		80-04	VU	EN		2*		1								2						↓	
Amphibia	<i>Batrachuperus gorganensis</i>	2	u		80-04	VU	CR												1						↓	
Amphibia	<i>Batrachuperus pinchonii</i>	2	u		80-04	LC	VU							1					2*						↓	
Amphibia	<i>Bolitoglossa capitana</i>	2	u		80-04	VU	CR	1																	↓	
Amphibia	<i>Bolitoglossa compacta</i>	2	u		80-04	NT	EN	1	2*																↓	
Amphibia	<i>Bolitoglossa lignicolor</i>	1	u		80-04	NT	VU	1	2*																↓	
Amphibia	<i>Bolitoglossa medemi</i>	1	u		80-04	NT	VU	1	2*						2*				2*						↓	
Amphibia	<i>Bolitoglossa pesrubra</i>	2	u		80-04	NT	EN			1															↓	
Amphibia	<i>Bolitoglossa platydactyla</i>	1	u		80-04	LC	NT	2	2						2									y	y	↓
Amphibia	<i>Bolitoglossa silverstonei</i>	1	u		80-04	NT	VU	2	2						2				2					y	y	↓
Amphibia	<i>Bolitoglossa spongai</i>	1	u		80-04	VU	EN	1																	↓	
Amphibia	<i>Bolitoglossa subpalmata</i>	2	u		80-04	NT	EN		1																↓	
Amphibia	<i>Bufo baxteri</i>	1	u		80-04	CR	EW		1														2*		↓	
Amphibia	<i>Bufo blombergi</i>	1	u		80-04	LC	NT	2	2						2	2			2					y	y	↓

Amphibia	<i>Bufo boreas</i>	1	u		80-04	LC	NT			1	2									2*			↓	
Amphibia	<i>Bufo brauni</i>	1	u		80-04	VU	EN	1	2				2	2								y	↓	
Amphibia	<i>Bufo caeruleostictus</i>	1	u		80-04	VU	EN	1	2*														↓	
Amphibia	<i>Bufo californicus</i>	2	u		80-04	NT	EN	2		2			2	2	2	2		2	2		2	y	y	↓
Amphibia	<i>Bufo canorus</i>	1	u		80-04	VU	EN	2*		1									2				↓	
Amphibia	<i>Bufo chavin</i>	1	u		80-04	EN	CR	1											2*				↓	
Amphibia	<i>Bufo fastidiosus</i>	2	u		80-04	EN	CR(PE)	2	2	1												y	↓	
Amphibia	<i>Bufo guentheri</i>	1	u		80-04	NT	VU	2	2									2				y	y	↓
Amphibia	<i>Bufo gundlachi</i>	1	u		80-04	NT	VU	1		2								2*					↓	
Amphibia	<i>Bufo holdridgei</i>	3	u		80-04	VU	CR(PE)			1													↓	
Amphibia	<i>Bufo lemur</i>	1	u		80-04	EN	CR								1								↓	
Amphibia	<i>Bufo mexicanus</i>	1	u		80-04	LC	NT	2	2				2					2				y	y	↓
Amphibia	<i>Bufo periglenes</i>	3	u		80-04	VU	EX			1							2*	2					n/a	
Amphibia	<i>Bufo peripatetes</i>	1	u		80-04	EN	CR	2*		1													?	
Amphibia	<i>Bufo rubropunctatus</i>	1	u		80-04	NT	VU	1					2*										↓	
Amphibia	<i>Bufo togoensis</i>	1	u		80-04	LC	NT	2	2				2									y	y	↓
Amphibia	<i>Caudiverbera caudiverbera</i>	2	u		80-04	LC	VU			2	2	1						2*					↓	
Amphibia	<i>Centrolene ballux</i>	2	u		80-04	EN	CR(PE)	2	2	2			2		2	1	2					y	↓	
Amphibia	<i>Centrolene heloderma</i>	3	u		80-04	VU	CR(PE)	2	2	2			2		2	1	2					y	↓	
Amphibia	<i>Centrolene lynchii</i>	1	u		80-04	VU	EN	2	2	2			2		2	1	2					y	↓	
Amphibia	<i>Ceratophrys ornata</i>	1	u		80-04	LC	NT	2				1	2				2					y	↓	
Amphibia	<i>Chaparana quadranus</i>	1	u		80-04	LC	NT					1					2*						↓	
Amphibia	<i>Chaparana unculatus</i>	2	u		80-04	NT	EN					1											↓	
Amphibia	<i>Chiropotrotriton cracens</i>	1	u		80-04	VU	EN			1													↓	
Amphibia	<i>Chiropotrotriton magnipes</i>	1	u		80-04	CR	CR(PE)		1						2*								?	
Amphibia	<i>Colostethus anthracinus</i>	1	u		80-04	EN	CR	2	2	1												y	↓	
Amphibia	<i>Colostethus delatorreae</i>	1	u		80-04	EN	CR	2	2	1												y	↓	
Amphibia	<i>Colostethus edwardsi</i>	1	u		80-04	CR	CR(PE)		1							2*							?	
Amphibia	<i>Colostethus elachyhistus</i>	1	u		80-04	VU	EN	2*		1													↓	
Amphibia	<i>Colostethus infraguttatus</i>	1	u		80-04	LC	NT	1	2*	2			2		2	2	2						↓	
Amphibia	<i>Colostethus lehmanni</i>	1	u		80-	LC	NT	2*	2	1			2		2	2	2						↓	

				04																					
Amphibia	<i>Colostethus leopardalis</i>	2	u		80-04	VU	CR		1																↓
Amphibia	<i>Colostethus machalilla</i>	1	u		80-04	LC	NT	1	2*																↓
Amphibia	<i>Colostethus olfersioides</i>	2	u		80-04	LC	VU	2	2	1				2										y	↓
Amphibia	<i>Colostethus pulchellus</i>	1	u		80-04	NT	VU	2	2	1				2				2						y	↓
Amphibia	<i>Colostethus ruizi</i>	1	u		80-04	CR	CR(PE)	1																	?
Amphibia	<i>Colostethus vertebralis</i>	3	u		80-04	VU	CR(PE)	2	2	1													y	↓	
Amphibia	<i>Conraua goliath</i>	2	u		80-04	NT	EN						1											↓	
Amphibia	<i>Crinia tinnula</i>	1	u		80-04	NT	VU			2			2	2									y	y	↓
Amphibia	<i>Dendrobates abditus</i>	1	u		80-04	CR	CR(PE)	1															2		?
Amphibia	<i>Dendrobates azureus</i>	2	d	y	80-04	CR	VU					1			2*									→	
Amphibia	<i>Dendrobates lehmanni</i>	1	u		80-04	EN	CR	2	2				2				2						y	y	↓
Amphibia	<i>Dendrobates steyermarki</i>	2	u		80-04	VU	CR						1											↓	
Amphibia	<i>Dendrobates sylvaticus</i>	1	u		80-04	LC	NT	1	2				2	2			2							↓	
Amphibia	<i>Dendrotriton cuchumatanus</i>	2	u		80-04	EN	CR(PE)		1															↓	
Amphibia	<i>Duellmanohyla salvavida</i>	1	u		80-04	EN	CR	1	2*															↓	
Amphibia	<i>Duellmanohyla soralia</i>	1	u		80-04	EN	CR	1	2*									2						↓	
Amphibia	<i>Duellmanohyla uranochroa</i>	2	u		80-04	VU	CR	2*	1															↓	
Amphibia	<i>Eleutherodactylus alfredi</i>	1	u		80-04	NT	VU	1	2*															↓	
Amphibia	<i>Eleutherodactylus amadeus</i>	1	u		80-04	EN	CR	2*	1															↓	
Amphibia	<i>Eleutherodactylus anciano</i>	1	u		80-04	CR	CR(PE)	2	2	1													y	?	
Amphibia	<i>Eleutherodactylus andi</i>	2	u		80-04	EN	CR(PE)			1														↓	
Amphibia	<i>Eleutherodactylus angelicus</i>	2	u		80-04	EN	CR(PE)			1														↓	
Amphibia	<i>Eleutherodactylus apostates</i>	1	u		80-04	EN	CR	2*	1															↓	
Amphibia	<i>Eleutherodactylus bakeri</i>	1	u		80-04	EN	CR	2*	1															↓	
Amphibia	<i>Eleutherodactylus berkenbuschii</i>	1	u		80-04	LC	NT	1	2*	2														↓	
Amphibia	<i>Eleutherodactylus bernali</i>	1	u		80-04	CR	CR(PE)	2*	1															?	
Amphibia	<i>Eleutherodactylus boconoensis</i>	2	u		80-04	VU	CR						2*				1							↓	
Amphibia	<i>Eleutherodactylus brevirostris</i>	1	u		80-04	EN	CR	2*	1															↓	
Amphibia	<i>Eleutherodactylus catalinae</i>	1	u		80-04	EN	CR			1														↓	
Amphibia	<i>Eleutherodactylus chlorophenax</i>	1	u		80-04	EN	CR	2*	1															↓	

Amphibia	<i>Eleutherodactylus chrysotetzes</i>	1	u		80-04	CR	EX	2	2	1			2		2			2			y	n/a
Amphibia	<i>Eleutherodactylus coffeus</i>	1	u		80-04	CR	CR(PE)	2	2				2		2						y	?
Amphibia	<i>Eleutherodactylus coqui</i>	1	u		80-04	LC	NT	2*		1											↓	
Amphibia	<i>Eleutherodactylus cruzi</i>	1	u		80-04	CR	CR(PE)			1											?	
Amphibia	<i>Eleutherodactylus emcelae</i>	1	u		80-04	EN	CR			1											↓	
Amphibia	<i>Eleutherodactylus emeleni</i>	2	u		80-04	EN	CR(PE)			1											↓	
Amphibia	<i>Eleutherodactylus eneidae</i>	2	u		80-04	EN	CR(PE)			1											↓	
Amphibia	<i>Eleutherodactylus epochthidius</i>	1	u		80-04	EN	CR	2	2	1			2		2						y	↓
Amphibia	<i>Eleutherodactylus escoces</i>	2	u		80-04	EN	CR(PE)			1											↓	
Amphibia	<i>Eleutherodactylus eunaster</i>	1	u		80-04	EN	CR	2*	1												↓	
Amphibia	<i>Eleutherodactylus fecundus</i>	2	u		80-04	EN	CR(PE)			1											↓	
Amphibia	<i>Eleutherodactylus fleischmanni</i>	2	u		80-04	EN	CR(PE)			1											↓	
Amphibia	<i>Eleutherodactylus fowleri</i>	1	u		80-04	EN	CR	2*	1												↓	
Amphibia	<i>Eleutherodactylus furcyensis</i>	1	u		80-04	EN	CR	2*	1												↓	
Amphibia	<i>Eleutherodactylus fuscus</i>	1	u		80-04	EN	CR	1	2				2								y	↓
Amphibia	<i>Eleutherodactylus ginesi</i>	1	u		80-04	VU	EN			1											↓	
Amphibia	<i>Eleutherodactylus glandulifer</i>	1	u		80-04	EN	CR	2*	1												↓	
Amphibia	<i>Eleutherodactylus glanduliferooides</i>	1	u		80-04	CR	CR(PE)	2*	1												?	
Amphibia	<i>Eleutherodactylus greggi</i>	1	u		80-04	EN	CR	2	2	1											y	↓
Amphibia	<i>Eleutherodactylus gryllus</i>	2	u		80-04	NT	EN			1											↓	
Amphibia	<i>Eleutherodactylus guerrerensis</i>	2	u		80-04	EN	CR(PE)	2	2	1											y	↓
Amphibia	<i>Eleutherodactylus hedricki</i>	2	u		80-04	NT	EN			1											↓	
Amphibia	<i>Eleutherodactylus heminota</i>	1	u		80-04	VU	EN	2*	1												↓	
Amphibia	<i>Eleutherodactylus jasperi</i>	2	u		80-04	EN	CR(PE)			1											↓	
Amphibia	<i>Eleutherodactylus jugans</i>	1	u		80-04	EN	CR	2*	1												↓	
Amphibia	<i>Eleutherodactylus karlschmidti</i>	1	u		80-04	CR	CR(PE)			1						2*					?	
Amphibia	<i>Eleutherodactylus laevissimus</i>	3	u		80-04	LC	EN	2	2	1			2		2		2				y	↓
Amphibia	<i>Eleutherodactylus lamprotes</i>	1	u		80-04	EN	CR	2*	1												↓	
Amphibia	<i>Eleutherodactylus lancinii</i>	1	u		80-04	VU	EN	2*		1					2						↓	
Amphibia	<i>Eleutherodactylus leonci</i>	1	u		80-04	EN	CR	2*	1												↓	
Amphibia	<i>Eleutherodactylus lineatus</i>	2	u		80-	VU	CR	2	2	1			2								y	↓

			04																						
Amphibia	<i>Eleutherodactylus locustus</i>	3	u		80-04	NT	CR			1															↓
Amphibia	<i>Eleutherodactylus martinicensis</i>	1	u		80-04	LC	NT	2	2	2			2										y	y	↓
Amphibia	<i>Eleutherodactylus merendensis</i>	3	u		80-04	VU	CR(PE)			1															↓
Amphibia	<i>Eleutherodactylus milesi</i>	2	u		80-04	EN	EX	2*		1															
Amphibia	<i>Eleutherodactylus nortoni</i>	1	u		80-04	EN	CR	2*	1				2												↓
Amphibia	<i>Eleutherodactylus olanchano</i>	3	u		80-04	VU	CR(PE)			1														↓	
Amphibia	<i>Eleutherodactylus omoensis</i>	1	u		80-04	CR	CR(PE)	2	2	1			2		2								y	?	
Amphibia	<i>Eleutherodactylus orcutti</i>	2	u		80-04	EN	CR(PE)			1															↓
Amphibia	<i>Eleutherodactylus oxyrhyncus</i>	1	u		80-04	EN	CR	2*	1																↓
Amphibia	<i>Eleutherodactylus parabates</i>	1	u		80-04	EN	CR	2*	1																↓
Amphibia	<i>Eleutherodactylus parapelates</i>	1	u		80-04	EN	CR	2*	1																↓
Amphibia	<i>Eleutherodactylus paulsoni</i>	1	u		80-04	EN	CR	2*	1																↓
Amphibia	<i>Eleutherodactylus polymniae</i>	2	u		80-04	EN	CR(PE)	2*		1															↓
Amphibia	<i>Eleutherodactylus portoricensis</i>	2	u		80-04	NT	EN			1															↓
Amphibia	<i>Eleutherodactylus ranoides</i>	4	u		80-04	LC	CR	2	2	1															↓
Amphibia	<i>Eleutherodactylus richmondi</i>	3	u		80-04	NT	CR			1															↓
Amphibia	<i>Eleutherodactylus rufescens</i>	2	u		80-04	VU	CR	1	2*																↓
Amphibia	<i>Eleutherodactylus rufifemoralis</i>	1	u		80-04	EN	CR	2*	1																↓
Amphibia	<i>Eleutherodactylus sabrinus</i>	1	u		80-04	VU	EN	2	2	1			2										y	↓	
Amphibia	<i>Eleutherodactylus saltuarius</i>	2	u		80-04	EN	CR(PE)	2*		1										2					↓
Amphibia	<i>Eleutherodactylus sandersoni</i>	1	u		80-04	VU	EN	2	2	1			2										y	↓	
Amphibia	<i>Eleutherodactylus schmidti</i>	3	u		80-04	VU	CR(PE)	2*		1										2					↓
Amphibia	<i>Eleutherodactylus semipalmatus</i>	1	u		80-04	CR	CR(PE)	2*	1															?	
Amphibia	<i>Eleutherodactylus stadelmani</i>	2	u		80-04	EN	CR(PE)	2*		1														↓	
Amphibia	<i>Eleutherodactylus symingtoni</i>	1	u		80-04	EN	CR	2*		1			2							2					↓
Amphibia	<i>Eleutherodactylus trachydermus</i>	1	u		80-04	CR	CR(PE)	2	2	1			2*											?	
Amphibia	<i>Eleutherodactylus unicolor</i>	2	u		80-04	VU	CR			1													→		
Amphibia	<i>Eleutherodactylus urichi</i>	1	u		80-04	VU	EN			1														↓	
Amphibia	<i>Eleutherodactylus warreni</i>	1	u		80-04	EN	CR	2*	1															↓	
Amphibia	<i>Eleutherodactylus wightmanae</i>	2	u		80-04	NT	EN	2		1			2							2				y	↓

Amphibia	<i>Eleutherodactylus zongoensis</i>	1	u		80-04	CR	CR(PE)						1													?
Amphibia	<i>Gastrophrynoidea borneensis</i>	1	u		80-04	NT	VU		1																↓	
Amphibia	<i>Gastrotheca angustifrons</i>	1	u		80-04	NT	VU	1	2*				2			2									↓	
Amphibia	<i>Gastrotheca lauzuricae</i>	1	u		80-04	CR	CR(PE)	1																	?	
Amphibia	<i>Gastrotheca pseustes</i>	3	u		80-04	LC	EN			1			2*												↓	
Amphibia	<i>Gastrotheca riobambae</i>	3	u		80-04	LC	EN	1																	↓	
Amphibia	<i>Gastrotheca splendens</i>	1	u		80-04	VU	EN	1					2*												↓	
Amphibia	<i>Glyphoglossus molossus</i>	1	u		80-04	LC	NT					1													↓	
Amphibia	<i>Heleioporus australiacus</i>	2	u		80-04	LC	VU	2	2	2			2		2		2					y	y	↓		
Amphibia	<i>Hemiphractus bubalus</i>	1	u		80-04	LC	NT	2	2				2									y	y	↓		
Amphibia	<i>Hemiphractus fasciatus</i>	1	u		80-04	LC	NT	2	2				2			2						y	y	↓		
Amphibia	<i>Hemisus guttatus</i>	1	u		80-04	NT	VU	1		2			2*											↓		
Amphibia	<i>Heterixalus rutenbergi</i>	1	u		80-04	LC	NT	1					2*												↓	
Amphibia	<i>Holoaden bradei</i>	1	u		80-04	CR	CR(PE)							2	2	2						y	y	?		
Amphibia	<i>Hyla albonigra</i>	1	u		80-04	LC	NT	1					2*			2									↓	
Amphibia	<i>Hyla altipotens</i>	2	u		80-04	EN	CR(PE)	2	2	1			2									y		↓		
Amphibia	<i>Hyla angustilineata</i>	1	u		80-04	EN	CR			1															↓	
Amphibia	<i>Hyla arborea</i>	1	u		80-04	LC	NT	2	2	2			2			2			2			y	y	↓		
Amphibia	<i>Hyla bocourti</i>	2	u		80-04	EN	CR(PE)	2		1						2*									↓	
Amphibia	<i>Hyla bromeliacia</i>	1	u		80-04	VU	EN	1		2						2*									↓	
Amphibia	<i>Hyla calvickolina</i>	1	u		80-04	CR	CR(PE)	2	2	1												y		?		
Amphibia	<i>Hyla calypsa</i>	2	u		80-04	EN	CR(PE)	2*		1														↓		
Amphibia	<i>Hyla celata</i>	1	u		80-04	CR	CR(PE)	2	2*	1			2												?	
Amphibia	<i>Hyla colymba</i>	1	u		80-04	VU	EN	2*	2	1														↓		
Amphibia	<i>Hyla cyanomma</i>	1	u		80-04	CR	CR(PE)	2	2*	1			2											?		
Amphibia	<i>Hyla debilis</i>	2	u		80-04	EN	CR(PE)	2	2	1			2								y		↓			
Amphibia	<i>Hyla dendroscarta</i>	2	u		80-04	EN	CR(PE)			1														↓		
Amphibia	<i>Hyla echinata</i>	2	u		80-04	EN	CR(PE)		2*	1														↓		
Amphibia	<i>Hyla graceae</i>	2	u		80-04	EN	CR(PE)			1														↓		
Amphibia	<i>Hyla hazelae</i>	2	u		80-04	EN	CR(PE)		2*	1														↓		
Amphibia	<i>Hyla heilprini</i>	1	u		80-	NT	VU	2*	1							2	2			2					↓	

			04																										
Amphibia	<i>Hyla pellita</i>	2	u		80-04	EN	CR(PE)	2	2	1			2												y	↓			
Amphibia	<i>Hyla rivularis</i>	3	u		80-04	VU	CR(PE)	2	2	1															y	↓			
Amphibia	<i>Hyla siopela</i>	1	u		80-04	CR	CR(PE)			1														2*		?			
Amphibia	<i>Hyla thorectes</i>	2	u		80-04	EN	CR(PE)	2*		1																↓			
Amphibia	<i>Hyla tica</i>	3	u		80-04	VU	CR(PE)		2*	1															↓				
Amphibia	<i>Hyla trux</i>	1	u		80-04	CR	CR(PE)	2*		1																?			
Amphibia	<i>Hyperolius chlorosteus</i>	1	u		80-04	LC	NT	2	2				2												y	y	↓		
Amphibia	<i>Hyperolius cystocandicans</i>	1	u		80-04	NT	VU	2*																1		↓			
Amphibia	<i>Ixalotriton parva</i>	1	u		80-04	CR	CR(PE)	2	2				2		2									y	y	?			
Amphibia	<i>Kalophrynsus subterrestris</i>	1	u		80-04	LC	NT		1																	↓			
Amphibia	<i>Kaloula mediolineata</i>	1	u		80-04	LC	NT	2				1		2		2									↓				
Amphibia	<i>Leiopelma archeyi</i>	3	u		80-04	NT	CR			1															↓				
Amphibia	<i>Leptodactylus fallax</i>	1	u		80-04	EN	CR	2		1		2*	2								2					↓			
Amphibia	<i>Leptodactylus laticeps</i>	1	u		80-04	LC	NT					1													↓				
Amphibia	<i>Leptodactylus silvanimbus</i>	1	u		80-04	EN	CR	1				2*													↓				
Amphibia	<i>Leptolalax dringi</i>	1	u		80-04	LC	NT		1								2*									↓			
Amphibia	<i>Leptolalax gracilis</i>	1	u		80-04	LC	NT		1								2*								↓				
Amphibia	<i>Leptopelis occidentalis</i>	1	u		80-04	LC	NT	2	2			2												y	y	↓			
Amphibia	<i>Leptophryne cruentata</i>	2	u		80-04	VU	CR													1		2*			↓				
Amphibia	<i>Limnonectes blythii</i>	1	u		80-04	LC	NT	2	2			1												y	↓				
Amphibia	<i>Limnonectes ibanorum</i>	1	u		80-04	LC	NT		1			2*													↓				
Amphibia	<i>Limnonectes ingeri</i>	1	u		80-04	LC	NT		1																↓				
Amphibia	<i>Limnonectes macrocephalus</i>	1	u		80-04	LC	NT	2	2			2	2				2							y	y	↓			
Amphibia	<i>Limnonectes magnus</i>	1	u		80-04	LC	NT	2	2			1					2							y	↓				
Amphibia	<i>Limnonectes malesianus</i>	1	u		80-04	LC	NT	2*	1																↓				
Amphibia	<i>Limnonectes paramacrodon</i>	1	u		80-04	LC	NT	2*	1			2		2											↓				
Amphibia	<i>Limnonectes rhacoda</i>	1	u		80-04	LC	NT		1																↓				
Amphibia	<i>Limnonectes tweediei</i>	1	u		80-04	LC	NT	2*	1									2							↓				
Amphibia	<i>Limnonectes visayanus</i>	1	u		80-04	NT	VU	2	2			1					2							y	↓				
Amphibia	<i>Litoria aurea</i>	1	u		80-04	NT	VU			1							2*								↓				

Amphibia	<i>Litoria booroongensis</i>	2	u		80-04	VU	CR	2	2	1											y	↓		
Amphibia	<i>Litoria brevipalmata</i>	1	u		80-04	VU	EN						2*							1			↓	
Amphibia	<i>Litoria castanea</i>	1	u		80-04	CR	CR(PE)	2		1									2			y	?	
Amphibia	<i>Litoria cooloolensis</i>	2	u		80-04	NT	EN			2						2			2			y	y	↓
Amphibia	<i>Litoria freycineti</i>	1	u		80-04	NT	VU	2		2			2		2	2						y	y	↓
Amphibia	<i>Litoria lorica</i>	2	u		80-04	EN	CR(PE)			1													↓	
Amphibia	<i>Litoria nannotis</i>	1	u		80-04	VU	EN			1											2*		→	
Amphibia	<i>Litoria nyakalensis</i>	3	u		80-04	VU	CR(PE)			1											2*		↓	
Amphibia	<i>Litoria pearsoniana</i>	1	u		80-04	LC	NT	2	2	1			2									y	↓	
Amphibia	<i>Litoria raniformis</i>	3	u		80-04	LC	EN			1						2*							↓	
Amphibia	<i>Litoria rheocola</i>	1	u		80-04	VU	EN			1													↓	
Amphibia	<i>Litoria spenceri</i>	1	u		80-04	EN	CR			1													↓	
Amphibia	<i>Mannophryne olmonae</i>	2	u		80-04	VU	CR			1													↓	
Amphibia	<i>Mantella cowanii</i>	1	u		80-04	EN	CR	2	2			1	2		2							y	↓	
Amphibia	<i>Melanophryniscus devincenzi</i>	1	u		80-04	VU	EN	2*									1						↓	
Amphibia	<i>Meristogenys phaeomerus</i>	1	u		80-04	LC	NT		1														↓	
Amphibia	<i>Meristogenys poecilus</i>	1	u		80-04	LC	NT		1														↓	
Amphibia	<i>Meristogenys whiteheadi</i>	1	u		80-04	LC	NT		1														↓	
Amphibia	<i>Microbatrachella capensis</i>	1	u		80-04	EN	CR	2		2			2							2		y	y	↓
Amphibia	<i>Microhyla perparva</i>	1	u		80-04	LC	NT		1														↓	
Amphibia	<i>Microhyla petrigena</i>	1	u		80-04	LC	NT		1														↓	
Amphibia	<i>Mixophyes balbus</i>	2	u		80-04	LC	VU	1	2*	2			2			2							↓	
Amphibia	<i>Mixophyes fleayi</i>	1	u		80-04	VU	EN	2	2	1			2									y	↓	
Amphibia	<i>Mixophyes iteratus</i>	3	u		80-04	LC	EN	2	2				2			1						y	↓	
Amphibia	<i>Nanorana pleskei</i>	1	u		80-04	LC	NT	1							2*								↓	
Amphibia	<i>Natalobatrachus bonebergi</i>	1	u		80-04	VU	EN	1	2				2			2						y	↓	
Amphibia	<i>Nectophrynoides asperginis</i>	3	u		80-04	VU	CR(PE)			2*						2			1				↓	
Amphibia	<i>Necturus alabamensis</i>	1	u		80-04	VU	EN										1						↓	
Amphibia	<i>Nephelobates meridensis</i>	1	u		80-04	EN	CR	1		2						2*							↓	
Amphibia	<i>Nimbaphrynoides occidentalis</i>	2	u		80-04	VU	CR							1									↓	
Amphibia	<i>Notopthalmus perstriatus</i>	1	u		80-	LC	NT	2		2		2	2		2			2		2		y	y	↓

			04																						
Amphibia	<i>Nyctimystes dayi</i>	1	u		80-04	VU	EN		1								2*								↓
Amphibia	<i>Nyctixalus pictus</i>	1	u		80-04	LC	NT	2*	1																↓
Amphibia	<i>Occidozyga baluensis</i>	1	u		80-04	LC	NT		1																↓
Amphibia	<i>Occidozyga borealis</i>	1	u		80-04	NT	VU	2*	2									1							↓
Amphibia	<i>Odontophryne moratoi</i>	1	u		80-04	CR	CR(PE)	1						1											?
Amphibia	<i>Oedipina gracilis</i>	1	u		80-04	VU	EN	2	2				2								y	y		↓	
Amphibia	<i>Oreolalax lichuanensis</i>	1	u		80-04	LC	NT		1																↓
Amphibia	<i>Oreolalax rugosus</i>	1	u		80-04	LC	NT	2*	1																↓
Amphibia	<i>Osornophryne percrassa</i>	1	u		80-04	VU	EN	1								2*									↓
Amphibia	<i>Osteopilus pulchrilineatus</i>	1	u		80-04	VU	EN	2	2	1			2										y		↓
Amphibia	<i>Osteopilus vastus</i>	1	u		80-04	VU	EN	2	2	1											y			↓	
Amphibia	<i>Paa boulengeri</i>	3	u		80-04	LC	EN		2*			1				2									↓
Amphibia	<i>Paa exilispinosa</i>	2	u		80-04	LC	VU		2*			1													↓
Amphibia	<i>Paa jiulongensis</i>	1	u		80-04	NT	VU		2*			1	2												↓
Amphibia	<i>Paa maculosa</i>	1	u		80-04	VU	EN					1													↓
Amphibia	<i>Paa shini</i>	2	u		80-04	LC	VU		2*			1						2							↓
Amphibia	<i>Paa spinosa</i>	2	u		80-04	LC	VU	2*				1						2							↓
Amphibia	<i>Paa yunnanensis</i>	3	u		80-04	LC	EN	2*				1				2									↓
Amphibia	<i>Pedostibes rugosus</i>	1	u		80-04	LC	NT	2	2							2					y	y		↓	
Amphibia	<i>Pelobates varaldii</i>	1	u		80-04	VU	EN	1		2						2*									↓
Amphibia	<i>Pelophryne signata</i>	1	u		80-04	LC	NT		1																↓
Amphibia	<i>Philautus aurantium</i>	1	u		80-04	VU	EN		1																↓
Amphibia	<i>Philautus hosii</i>	1	u		80-04	LC	NT		1																↓
Amphibia	<i>Philautus kerangae</i>	1	u		80-04	VU	EN		1																↓
Amphibia	<i>Philautus tectus</i>	1	u		80-04	NT	VU		1																↓
Amphibia	<i>Philoria frosti</i>	1	u		80-04	EN	CR		1							2*									↓
Amphibia	<i>Philoria sphagnicolus</i>	1	u		80-04	VU	EN	1								2*									↓
Amphibia	<i>Phrynobatrachus allenii</i>	1	u		80-04	LC	NT	2	2				2								y	y		↓	
Amphibia	<i>Phrynobatrachus guineensis</i>	1	u		80-04	LC	NT	2	2				2								y	y		↓	
Amphibia	<i>Phrynobatrachus liberiensis</i>	1	u		80-04	LC	NT	2	2				2								y	y		↓	

Amphibia	<i>Phrynobatrachus phyllophilus</i>	1	u		80-04	LC	NT	2	2			2									y	y	↓
Amphibia	<i>Phrynobius dagmarae</i>	1	u		80-04	EN	CR	1															↓
Amphibia	<i>Phrynobius kauneorum</i>	1	u		80-04	EN	CR	1															↓
Amphibia	<i>Phrynobius spectabilis</i>	1	u		80-04	CR	CR(PE)	1															?
Amphibia	<i>Phylomedusa lemur</i>	1	u		80-04	VU	EN	2	2	1			2								y	↓	
Amphibia	<i>Platymantis akarithymus</i>	1	u		80-04	NT	VU		1														↓
Amphibia	<i>Platymantis hazelae</i>	1	u		80-04	VU	EN	1	2*														↓
Amphibia	<i>Plectrohyla dasypus</i>	1	u		80-04	EN	CR			1													↓
Amphibia	<i>Plectrohyla glandulosa</i>	1	u		80-04	VU	EN	2	2				2								y	y	↓
Amphibia	<i>Plectrohyla guatemalensis</i>	4	u		80-04	LC	CR			1													↓
Amphibia	<i>Plectrohyla hartwegi</i>	2	u		80-04	VU	CR	2	2	1			2								y	↓	
Amphibia	<i>Plethodon neomexicanus</i>	2	d	y	80-04	EN	NT	2*	1														→
Amphibia	<i>Pleurodema bibroni</i>	1	u		80-04	LC	NT	1					2*										↓
Amphibia	<i>Pleurodema kriegi</i>	2	d	y	80-04	EN	NT	1															↑
Amphibia	<i>Pseudoeurycea aquatica</i>	1	u		80-04	CR	CR(PE)	2	2				2								y	y	?
Amphibia	<i>Pseudoeurycea bellii</i>	2	u		80-04	LC	VU			1													↓
Amphibia	<i>Pseudoeurycea cephalica</i>	1	u		80-04	LC	NT	2	2				2								y		↓
Amphibia	<i>Pseudoeurycea naucampatepetl</i>	1	u		80-04	CR	CR(PE)	2	2				2								y	y	?
Amphibia	<i>Pseudoeurycea nigromaculata</i>	1	u		80-04	CR	CR(PE)	2	2				2								y	y	?
Amphibia	<i>Pseudoeurycea smithi</i>	1	u		80-04	EN	CR			1													↓
Amphibia	<i>Pseudophryne bibronii</i>	1	u		80-04	LC	NT	2					2				2	2			1	y	↓
Amphibia	<i>Pseudophryne corroboree</i>	1	u		80-04	EN	CR			1							2*	2					↓
Amphibia	<i>Pseudophryne pengillyi</i>	1	u		80-04	VU	EN			1								2*					↓
Amphibia	<i>Ptychadena newtoni</i>	2	u		80-04	VU	CR	1					2*										↓
Amphibia	<i>Ptychadena superciliaris</i>	1	u		80-04	LC	NT	2	2				2								y		↓
Amphibia	<i>Ptychohyla hypomykter</i>	2	u		80-04	NT	EN	2*		1							2	2					↓
Amphibia	<i>Rana areolata</i>	1	u		80-04	LC	NT	1		2			2*										↓
Amphibia	<i>Rana aurora</i>	1	u		80-04	LC	NT	1		2			2*										↓
Amphibia	<i>Rana boylii</i>	1	u		80-04	LC	NT			2										2	1	y	↓
Amphibia	<i>Rana capito</i>	1	u		80-04	LC	NT	1		2							2	2	2	2		y	↓
Amphibia	<i>Rana cascadae</i>	1	u		80-	LC	NT			1								2*	2				↓

			04																							
Amphibia	<i>Rana chosenica</i>	1	u		80-04	NT	VU	1					2											y	↓	
Amphibia	<i>Rana grahami</i>	1	u		80-04	LC	NT	2*				1												↓		
Amphibia	<i>Rana holtzi</i>	2	u		80-04	VU	CR		2		2	2							2				y	y	↓	
Amphibia	<i>Rana iberica</i>	1	u		80-04	LC	NT	2	2	2			2	2			2						y	y	↓	
Amphibia	<i>Rana jingdongensis</i>	2	u		80-04	LC	VU	2	2			1	2										y	↓		
Amphibia	<i>Rana latastei</i>	1	u		80-04	NT	VU	1	2	2								2					y	↓		
Amphibia	<i>Rana megapoda</i>	2	u		80-04	LC	VU		2			1					2*						↓			
Amphibia	<i>Rana minima</i>	1	u		80-04	EN	CR	2					2			2						y	y	↓		
Amphibia	<i>Rana muscosa</i>	1	u		80-04	NT	VU			1													↓			
Amphibia	<i>Rana nigromaculata</i>	1	u		80-04	LC	NT	2*				1					2						↓			
Amphibia	<i>Rana omeimiana</i>	2	u		80-04	EN	CR(PE)		1										2*				↓			
Amphibia	<i>Rana shqiperica</i>	2	u		80-04	NT	EN		2		2					2			2		y	y	↓			
Amphibia	<i>Rana tarahumarae</i>	2	u		80-04	LC	VU		1					2*									↓			
Amphibia	<i>Rana tlahoci</i>	1	u		80-04	CR	CR(PE)					1											?			
Amphibia	<i>Rana vibicaria</i>	1	u		80-04	EN	CR			1													↓			
Amphibia	<i>Rana warszewitschii</i>	1	u		80-04	LC	NT	2	2	1			2									y	↓			
Amphibia	<i>Rhacophorus bifasciatus</i>	1	u		80-04	LC	NT	1															↓			
Amphibia	<i>Rhacophorus dulitensis</i>	1	u		80-04	LC	NT		1														↓			
Amphibia	<i>Rhacophorus kajau</i>	1	u		80-04	LC	NT		1														↓			
Amphibia	<i>Rhacophorus rufipes</i>	1	u		80-04	LC	NT		1														?			
Amphibia	<i>Rheobatrachus silus</i>	1	u		80-04	CR	EX		2*	1													n/a			
Amphibia	<i>Rheobatrachus vitellinus</i>	1	u		80-04	CR	EX			1					2*								n/a			
Amphibia	<i>Rhinoderma darwinii</i>	2	u		80-04	LC	VU	2	2	1						2						y	↓			
Amphibia	<i>Scaphiophryne gottlebei</i>	1	u		80-04	EN	CR					1											↓			
Amphibia	<i>Scutiger maculatus</i>	1	u		80-04	CR	CR(PE)	1					1										?			
Amphibia	<i>Spea hammondii</i>	1	u		80-04	LC	NT	2*		2			1										↓			
Amphibia	<i>Speleomantes supramontis</i>	2	u		80-04	NT	EN	1	2*														↓			
Amphibia	<i>Staurois tuberilinguis</i>	1	u		80-04	LC	NT		1							2*							↓			
Amphibia	<i>Strongylopus wageri</i>	1	u		80-04	LC	NT	1		2*													↓			
Amphibia	<i>Stumpffia helenae</i>	1	u		80-04	EN	CR	2	2						2							y	y	↓		

Amphibia	<i>Taudactylus acutirostris</i>	3	u		80-04	VU	CR(PE)			1														↓	
Amphibia	<i>Taudactylus eungellensis</i>	1	u		80-04	EN	CR			1														↑	
Amphibia	<i>Taudactylus pleione</i>	2	u		80-04	VU	CR	2	2	1			2		2		2						y	↓	
Amphibia	<i>Taudactylus rheophilus</i>	1	u		80-04	EN	CR			1														?	
Amphibia	<i>Telmatobius arequipensis</i>	1	u		80-04	NT	VU					1					2*							↓	
Amphibia	<i>Telmatobius brevipes</i>	1	u		80-04	VU	EN			1														↓	
Amphibia	<i>Telmatobius carrillae</i>	1	u		80-04	NT	VU			1														↓	
Amphibia	<i>Telmatobius cirrhacelis</i>	1	u		80-04	CR	CR(PE)	2		2			2		2							y	y	?	
Amphibia	<i>Telmatobius colanensis</i>	1	u		80-04	VU	EN			1														?	
Amphibia	<i>Telmatobius culeus</i>	2	u		80-04	VU	CR			2		1					2				2		y	↓	
Amphibia	<i>Telmatobius gigas</i>	2	u		80-04	VU	CR					1					2				2		y	↓	
Amphibia	<i>Telmatobius huayra</i>	1	u		80-04	NT	VU										1							↓	
Amphibia	<i>Telmatobius jelskii</i>	1	u		80-04	LC	NT					1					2							↓	
Amphibia	<i>Telmatobius marmoratus</i>	2	u		80-04	LC	VU			2*		1					2							↓	
Amphibia	<i>Telmatobius niger</i>	3	u		80-04	VU	CR(PE)	2		1		2	2				2						y	↓	
Amphibia	<i>Telmatobius pefauri</i>	2	u		80-04	VU	CR	2*													1			↓	
Amphibia	<i>Telmatobius simonsi</i>	1	u		80-04	LC	NT	2	2								2						y	y	↓
Amphibia	<i>Telmatobius vellardi</i>	2	u		80-04	EN	CR(PE)	2		1		2	2				2						y	↓	
Amphibia	<i>Telmatobius zapahuirensis</i>	2	u		80-04	VU	CR	2*													1			↓	
Amphibia	<i>Thorius infernalis</i>	1	u		80-04	CR	CR(PE)	1				2*												?	
Amphibia	<i>Thorius magnipes</i>	1	u		80-04	CR	CR(PE)	1	1															?	
Amphibia	<i>Thorius narismagnus</i>	1	u		80-04	CR	CR(PE)	2	2	2			2									y	y	?	
Amphibia	<i>Thorius narisovalis</i>	2	u		80-04	EN	CR(PE)	2	2	1			2					2*						↓	
Amphibia	<i>Thorius pennatus</i>	1	u		80-04	EN	CR	2	2	1			2						2*					↓	
Amphibia	<i>Triturus pygmaeus</i>	1	u		80-04	LC	NT	2		2			2				2				1		y	↓	
Amphibia	<i>Tylopotriton asperrimus</i>	1	u		80-04	LC	NT	2*	2			1												↓	
Amphibia	<i>Tylopotriton shanjing</i>	1	u		80-04	LC	NT					1	2*											↓	
Aves	<i>Accipiter princeps</i>	1	u		94-00	NT	VU	1	2*															↓	
Aves	<i>Aceros comatus</i>	1	u		94-00	LC	NT	1	2*								2							↓	
Aves	<i>Acrocephalus griseldis</i>	1	u		00-04	VU	EN										2*				1			↓	
Aves	<i>Acrocephalus griseldis</i>	1	u		94-	NT	VU										2*				1			↓	

				00																					
Aves	<i>Acrocephalus luscinius</i>	1	u		00-04	EN	CR	2*		1			2		2		2								↓
Aves	<i>Acrocephalus rodericanus</i>	1	d	y	94-00	CR	EN	2*	2	1						2		2							→
Aves	<i>Actenoides concretus</i>	1	u		94-00	LC	NT	1	2																↓
Aves	<i>Aegithina viridissima</i>	1	u		94-00	LC	NT	1	2*						2										↓
Aves	<i>Agelaius tricolor</i>	3	u		94-00	LC	EN	1									2*								↓
Aves	<i>Alcedo euryzona</i>	1	u		94-00	NT	VU	1	2*				2												↓
Aves	<i>Alcippe brunneicauda</i>	1	u		94-00	LC	NT	1	2*				2												↓
Aves	<i>Alethe choloensis</i>	1	u		94-00	VU	EN	1	2*			2		2											↓
Aves	<i>Allophoxus finschii</i>	1	u		94-00	LC	NT	1	2*				2												↓
Aves	<i>Amazona brasiliensis</i>	1	d	y	00-04	EN	VU	2*	2			1	2												↑
Aves	<i>Anas eatoni</i>	1	u		94-00	NT	VU			1															↓
Aves	<i>Anas luzonica</i>	1	u		94-00	NT	VU	2*	2			1			2										↓
Aves	<i>Anas melleri</i>	1	u		88-94	VU	EN	2*	2	2		1													↓
Aves	<i>Anodorhynchus hyacinthinus</i>	1	u		94-00	VU	EN	2*	2			1													↓
Aves	<i>Anodorhynchus leari</i>	1	d	y	00-04	CR	EN	2*				1													?
Aves	<i>Anthracoceros montani</i>	1	u		88-94	EN	CR	1	2*			2	2												↓
Aves	<i>Anthreptes rhodolaemus</i>	1	u		94-00	LC	NT	1	2*				2												↓
Aves	<i>Anthus sokokensis</i>	1	u		94-00	VU	EN	2*	1																↓
Aves	<i>Apteryx owenii</i>	1	d	y	00-04	VU	NT	1																	→
Aves	<i>Ara glaucogularis</i>	1	u		94-00	EN	CR	2*	2		2	1													↑
Aves	<i>Ardeola idae</i>	1	u		88-94	VU	EN	1		2		2*													↓
Aves	<i>Argusianus argus</i>	1	u		94-00	LC	NT	1	2*			2			2										↓
Aves	<i>Atrichornis rufescens</i>	1	u		04-08	NT	VU	2*					1	2											↓
Aves	<i>Aythya baeri</i>	1	u		04-08	VU	EN	1				1													↓
Aves	<i>Balearica pavonina</i>	1	u		88-94	LC	NT	1				2			2	2	2			2					↓
Aves	<i>Balearica pavonina</i>	1	u		94-00	NT	VU	1				2			2	2	2			2					↓
Aves	<i>Batrachostomus stellatus</i>	1	u		94-00	LC	NT	1	2*				2												↓
Aves	<i>Brachyramphus brevirostris</i>	2	u		88-94	LC	VU									1	2	2	2					y	↓
Aves	<i>Brachyramphus brevirostris</i>	2	u		94-00	VU	CR									1	2	2	2					y	↓
Aves	<i>Bradypterus graueri</i>	1	u		88-94	VU	EN	1				2*													↓

Aves	<i>Branta ruficollis</i>	1	u		00-04	VU	EN	2			2	1	2				2					y	↓
Aves	<i>Brotogeris pyrrhoptera</i>	1	u		88-94	VU	EN	2*	2			1											↓
Aves	<i>Buceros rhinoceros</i>	1	u		94-00	LC	NT	1	2*							2							↓
Aves	<i>Buteo ridgwayi</i>	1	u		94-00	EN	CR	1					2*						2				↓
Aves	<i>Cacatua haematuropygia</i>	1	u		88-94	EN	CR	2*	2			1											↓
Aves	<i>Cacatua ophthalmica</i>	1	u		94-00	NT	VU	1	2*			2*											↓
Aves	<i>Cacatua sulphurea</i>	1	u		94-00	EN	CR	2*	2			1				2							↓
Aves	<i>Caloperdix oculeus</i>	1	u		94-00	LC	NT	1	2*			2			2								↓
Aves	<i>Calyptomena hosii</i>	1	u		94-00	LC	NT	1	2*						2								↓
Aves	<i>Calyptomena viridis</i>	1	u		94-00	LC	NT	1	2*						2								↓
Aves	<i>Caprimulgus concretus</i>	1	u		94-00	NT	VU	1	2*						2								↓
Aves	<i>Centropus rectunguis</i>	1	u		94-00	NT	VU	1	2*						2								↓
Aves	<i>Centropus violaceus</i>	1	u		94-00	LC	NT	1	2*														↓
Aves	<i>Cercomacra ferdinandi</i>	1	u		00-04	NT	VU													1			↓
Aves	<i>Cercomacra ferdinandi</i>	1	u		94-00	LC	NT													1			↓
Aves	<i>Chaetura pelagica</i>	1	u		94-00	LC	NT						1										↓
Aves	<i>Charadrius sanctaehelenae</i>	1	u		04-08	EN	CR	1		2*													↑
Aves	<i>Chlamydotis undulata</i>	1	u		00-04	NT	VU					1	2*					2	2				↓
Aves	<i>Chlamydotis undulata</i>	1	u		94-00	LC	NT					1	2*					2	2				↓
Aves	<i>Chloropsis cyanopogon</i>	1	u		94-00	LC	NT	1	2*						2								↓
Aves	<i>Cleptornis marchei</i>	2	u		00-04	VU	CR		1														↓
Aves	<i>Columba eversmanni</i>	1	u		88-94	NT	VU	2*				1											↓
Aves	<i>Columba trocaz</i>	1	d	y	88-94	VU	NT	2	2	2		1	2									y	↑
Aves	<i>Copsychus sechellarum</i>	1	d	y	00-04	CR	EN	2*		1													↑
Aves	<i>Coracias garrulus</i>	1	u		94-00	LC	NT	1				2*											↓
Aves	<i>Coracina newtoni</i>	1	u		00-04	EN	CR			1		2*											↓
Aves	<i>Corvus hawaiiensis</i>	1	u		00-04	CR	EW	2*	2	1		2						2				n/a	
Aves	<i>Corvus kubaryi</i>	1	u		94-00	EN	CR	2		1		2	2*			2							↓
Aves	<i>Crax blumenbachii</i>	1	d	y	94-00	CR	EN	1				2*											↓
Aves	<i>Cuculus vagans</i>	1	u		94-00	LC	NT	1	2*						2								↓
Aves	<i>Cyanopsitta spixii</i>	1	u		00-	CR	CR(PEW)	2*	2			1	2										?

				04																						
Aves	<i>Cyanoramphus cookii</i>	1	d	y	94-00	CR	EN		1																	↑
Aves	<i>Cyanoramphus malherbi</i>	1	u		94-00	EN	CR		1																	↑
Aves	<i>Cyornis caerulatus</i>	1	u		94-00	NT	VU	1	2*									2								↓
Aves	<i>Dasyornis longirostris</i>	1	d	y	94-00	EN	VU												1							↓
Aves	<i>Dendroica kirtlandii</i>	1	d	y	88-94	VU	NT		1		2							2*								↑
Aves	<i>Dinopium rafflesii</i>	1	u		94-00	LC	NT	1	2*									2								↓
Aves	<i>Diomedea dabbenena</i>	1	u		88-94	EN	CR		2*											1						↓
Aves	<i>Ducula finschii</i>	1	u		94-00	LC	NT	1	2*																	↓
Aves	<i>Ducula galeata</i>	1	d	y	00-04	CR	EN		2*		1															↑
Aves	<i>Ducula rubricera</i>	1	u		94-00	LC	NT	1	2*																	↓
Aves	<i>Ducula whartoni</i>	2	d	y	00-04	CR	VU		1																	→
Aves	<i>Ducula whartoni</i>	2	u		94-00	VU	CR		1																	→
Aves	<i>Emberiza aureola</i>	1	u		94-00	NT	VU	2*			1									2						↓
Aves	<i>Emberiza jankowskii</i>	1	u		00-04	VU	EN	1			2	2	2					2								↓
Aves	<i>Enicurus ruficapillus</i>	1	u		94-00	LC	NT	1	2*									2								↓
Aves	<i>Eupetes macrocerus</i>	1	u		94-00	LC	NT	1	2*									2								↓
Aves	<i>Eurylaimus ochromalus</i>	1	u		94-00	LC	NT	1	2*									2								↓
Aves	<i>Eurynorhynchus pygmeus</i>	1	u		04-08	EN	CR			2*	1								2							↓
Aves	<i>Eurynorhynchus pygmeus</i>	1	u		94-00	VU	EN			2*	1								2							↓
Aves	<i>Eurystomus azureus</i>	1	u		94-00	LC	NT	2	1			2*	2													↓
Aves	<i>Falco cherrug</i>	1	u		00-04	VU	EN	2*			1							2								↓
Aves	<i>Falco cherrug</i>	1	u		94-00	NT	VU	2*			1							2								↓
Aves	<i>Falco punctatus</i>	1	d	y	88-94	CR	EN		2*										1							↑
Aves	<i>Falco punctatus</i>	1	d	y	94-00	EN	VU		2*										1							↑
Aves	<i>Ficedula dumetoria</i>	1	u		94-00	LC	NT	1	2*									2								↓
Aves	<i>Forpus xanthops</i>	1	u		88-94	NT	VU				1														→	
Aves	<i>Foudia flavicans</i>	1	d	y	88-94	EN	VU	1	2	2*								2								↑
Aves	<i>Foudia rubra</i>	1	d	y	94-00	CR	EN	2		1																↓
Aves	<i>Foudia sechellarum</i>	1	d	y	04-08	VU	NT	1		2*																→
Aves	<i>Francolinus camerunensis</i>	1	u		94-00	VU	EN	2*			2							1								↓

				00																			
Aves	<i>Malacopteron affine</i>	1	u		94-00	LC	NT	1	2*								2						↓
Aves	<i>Malacopteron magnum</i>	1	u		94-00	LC	NT	1	2*								2						↓
Aves	<i>Megalaima henricii</i>	1	u		94-00	LC	NT	1	2*								2						↓
Aves	<i>Megalaima mystacophanous</i>	1	u		94-00	LC	NT	1	2*								2						↓
Aves	<i>Megalurus grosvenori</i>	1	u		94-00	NT	VU	1	2*														↓
Aves	<i>Megapodius pritchardii</i>	1	d	y	00-04	CR	EN			2*	1												↓
Aves	<i>Meiglyptes tukki</i>	1	u		94-00	LC	NT	1	2*								2						↓
Aves	<i>Melamprosops phaeosoma</i>	1	u		04-08	CR	CR(PE)	2*		1							2						↓
Aves	<i>Melanoperdix niger</i>	1	u		94-00	NT	VU	2	1								2						↓
Aves	<i>Melidectes whittemanensis</i>	1	u		94-00	LC	NT	1	2*														↓
Aves	<i>Menura alberti</i>	1	d	y	04-08	VU	NT		1														↓
Aves	<i>Metallura iracunda</i>	1	u		00-04	VU	EN	1						2*	2								↓
Aves	<i>Milvus milvus</i>	1	u		94-00	LC	NT	2								1				2*			↓
Aves	<i>Mimus trifasciatus</i>	1	u		04-08	EN	CR			1									2*				↑
Aves	<i>Mitu mitu</i>	1	u		88-94	CR	EW	1							2*								n/a
Aves	<i>Mohoua ochrocephala</i>	1	u		94-00	VU	EN			1													↓
Aves	<i>Myadestes lanaiensis</i>	1	u		88-94	CR	CR(PE)	2*		1													?
Aves	<i>Myadestes myadestinus</i>	1	u		88-94	CR	EX	2	1												2		n/a
Aves	<i>Myiagra albiventris</i>	2	u		88-94	LC	VU	2*		2								1					↓
Aves	<i>Myophonus robinsoni</i>	2	d	n	00-04	VU	LC													1			↓
Aves	<i>Myophonus robinsoni</i>	2	u		94-00	LC	VU													1			↓
Aves	<i>Neophema chrysogaster</i>	1	u		88-94	EN	CR	1	2					2*	2								↓
Aves	<i>Neophron percnopterus</i>	3	u		00-04	LC	EN							2					1	2			1
Aves	<i>Neotis denhami</i>	1	u		94-00	LC	NT	2*						1									↓
Aves	<i>Nesoclopeus woodfordi</i>	1	d	n	00-04	VU	NT	1															↓
Aves	<i>Nesoenas mayeri</i>	1	d	y	88-94	CR	EN	2*		1								2					↓
Aves	<i>Ninox natalis</i>	2	d	y	00-04	CR	VU			1					2*								→
Aves	<i>Ninox natalis</i>	2	u		94-00	VU	CR			1					2*								→
Aves	<i>Ninox odiosa</i>	1	u		94-00	NT	VU	1	2*														↓
Aves	<i>Nipponia nippon</i>	1	d	y	94-00	CR	EN	1											2				↑

Aves	<i>Numenius arquata</i>	1	u		94-00	LC	NT	1				2	2			2		2		y	↓
Aves	<i>Ognorhynchus icterotis</i>	1	d	y	00-04	CR	EN	1	2			2						2*			↑
Aves	<i>Oriolus xanthornotus</i>	1	u		94-00	LC	NT	1	2*						2					↓	
Aves	<i>Otus rufescens</i>	1	u		94-00	LC	NT	1	2*						2					↓	
Aves	<i>Oxyura leucocephala</i>	1	u		94-00	VU	EN	1				2			2	2		1		y	↓
Aves	<i>Padda oryzivora</i>	1	u		88-94	NT	VU					1									↓
Aves	<i>Palmeria dolei</i>	2	u		00-04	VU	CR	2*		1		2								↓	
Aves	<i>Papasula abbotti</i>	1	d	y	00-04	CR	EN			1				2*						↓	
Aves	<i>Papasula abbotti</i>	1	u		94-00	EN	CR			1				2*						↓	
Aves	<i>Paroreomyza maculata</i>	1	u		88-94	CR	CR(PE)	1		2*		2					2			?	
Aves	<i>Paroreomyza montana</i>	1	u		00-04	VU	EN	2*		1		2								↓	
Aves	<i>Patagioenas inornata</i>	1	d	n	94-00	VU	NT	1	2			2			2				y	↓	
Aves	<i>Pauxi pauxi</i>	1	u		04-08	VU	EN	1				2*								↓	
Aves	<i>Pelecanus crispus</i>	1	u		00-04	NT	VU	1				2	2			2	2	2		y	↓
Aves	<i>Pelecanus crispus</i>	1	d	y	94-00	VU	NT	1				2	2			2	2	2		y	↓
Aves	<i>Penelope jacucaca</i>	1	u		00-04	NT	VU	2*				1								↓	
Aves	<i>Penelope ortoni</i>	1	u		00-04	VU	EN	1	2			2*					2			↓	
Aves	<i>Pericrocotus igneus</i>	1	u		94-00	LC	NT	1	2*						2					↓	
Aves	<i>Phaenicophaeus diardi</i>	1	u		94-00	LC	NT	1	2*						2					↓	
Aves	<i>Phaenicophaeus sumatrana</i>	1	u		94-00	LC	NT	1	2*						2					↓	
Aves	<i>Phalacrocorax bougainvillii</i>	1	u		94-00	LC	NT					2*			1		2			↓	
Aves	<i>Phalacrocorax featherstoni</i>	1	u		00-04	VU	EN			2*							1			↓	
Aves	<i>Phalacrocorax neglectus</i>	1	u		94-00	VU	EN								2	2*	1			↓	
Aves	<i>Philentoma velata</i>	1	u		94-00	LC	NT	1	2*					2						↓	
Aves	<i>Phoebastria irrorata</i>	2	u		00-04	VU	CR			2	1			2			2*			↓	
Aves	<i>Phoebastria nigripes</i>	1	u		00-04	VU	EN										1			↑	
Aves	<i>Phoebastria nigripes</i>	2	u		94-00	LC	VU										1			↑	
Aves	<i>Phoebeoria fusca</i>	1	u		00-04	VU	EN			2*							1			↓	
Aves	<i>Phoenicoparrus jamesi</i>	1	d	y	94-00	VU	NT					1	2*			2				↓	
Aves	<i>Phoenicopterus chilensis</i>	1	u		88-94	LC	NT					1	2			2		2*		↓	
Aves	<i>Picumnus fuscus</i>	1	u		94-	LC	NT	2*	2			1								↓	

				00																							
Aves	<i>Pipile jacutinga</i>	1	u		94-00	VU	EN	2*				1															↓
Aves	<i>Pitta baudii</i>	1	u		94-00	NT	VU	2*	1									2	2							↓	
Aves	<i>Pitta granatina</i>	1	u		94-00	LC	NT	1	2*									2								↓	
Aves	<i>Platalea minor</i>	1	d	y	94-00	CR	EN	2				2	2*						1	2						↓	
Aves	<i>Platylophus galericulatus</i>	1	u		94-00	LC	NT	1	2*									2								↓	
Aves	<i>Podiceps gallardoi</i>	1	u		04-08	VU	EN			2*									1							→	
Aves	<i>Podiceps gallardoi</i>	1	u		00-04	NT	VU			2*									1							→	
Aves	<i>Polysticta stelleri</i>	1	u		00-04	NT	VU				2	2						2	2					1		↓	
Aves	<i>Pomarea dimidiata</i>	1	d	y	88-94	CR	EN	2		1									2*							↑	
Aves	<i>Pomarea whitneyi</i>	2	u		94-00	VU	CR			1															↓		
Aves	<i>Prinia cinereocapilla</i>	1	u		94-00	NT	VU	1	2*																↓		
Aves	<i>Prionochilus thoracicus</i>	1	u		94-00	LC	NT	1	2*									2							↓		
Aves	<i>Procnias nudicollis</i>	1	u		00-04	NT	VU	2*				1	2												↓		
Aves	<i>Pseudodibis davisoni</i>	1	u		94-00	EN	CR	1	2			2*						2		2		2			↓		
Aves	<i>Pseudonestor xanthophrys</i>	2	u		00-04	VU	CR			1															↓		
Aves	<i>Psittacula eques</i>	1	d	y	00-04	CR	EN	1		2*									2							↑	
Aves	<i>Psittacula longicauda</i>	1	u		94-00	LC	NT	1	2*									2							↓		
Aves	<i>Psittirostra psittacea</i>	1	u		88-94	CR	CR(PE)	2*	2	1															?		
Aves	<i>Pterodroma alba</i>	1	u		00-04	VU	EN			1															↓		
Aves	<i>Pterodroma axillaris</i>	1	d	y	04-08	CR	EN			2*	1														↓		
Aves	<i>Pterodroma baraui</i>	1	u		88-94	EN	CR			2		1						2*							↓		
Aves	<i>Pterodroma baraui</i>	1	d	y	94-00	CR	EN			2		1						2*							↓		
Aves	<i>Pterodroma cookii</i>	1	d	y	04-08	EN	VU			1															↑		
Aves	<i>Ptilinopus jambu</i>	1	u		94-00	LC	NT	1	2*			2			2			2							↓		
Aves	<i>Ptilinopus roseicapilla</i>	2	u		00-04	NT	EN			1															↓		
Aves	<i>Ptilocichla leucogrammica</i>	1	u		94-00	NT	VU	1	2*						2	2									↓		
Aves	<i>Puffinus mauretanicus</i>	1	u		00-04	EN	CR			1		2							2*						↓		
Aves	<i>Puffinus mauretanicus</i>	1	u		94-00	VU	EN			1		2							2*						↓		
Aves	<i>Puffinus opisthomelas</i>	1	d	y	00-04	VU	NT			1		2*							2							?	
Aves	<i>Pycnonotus cyaniventris</i>	1	u		94-00	LC	NT	1	2*									2							↓		

				04																						
Aves	<i>Synallaxis fuscorufa</i>	1	u		00-04	NT	VU	1	2*									2								↓
Aves	<i>Syphoetides indicus</i>	1	d	n	88-94	CR	EN	2					2					1								↓
Aves	<i>Tachybaptus rufolavatus</i>	1	u		88-94	CR	EX	2		1	2										2*				n/a	
Aves	<i>Tetrao mlokosiewiczi</i>	1	u		04-08	LC	NT	2*				2	2						1							↓
Aves	<i>Thalassarche melanophrys</i>	2	u		94-00	NT	EN															1			↓	
Aves	<i>Todiramphus funebris</i>	1	u		94-00	NT	VU	2	1				2	2											↓	
Aves	<i>Todiramphus godeffroyi</i>	1	u		94-00	EN	CR		1																↓	
Aves	<i>Torgos tracheliotos</i>	1	u		88-94	NT	VU					2*							1	2					↓	
Aves	<i>Toxostoma guttatum</i>	2	u		88-94	VU	CR		2*												1				↓	
Aves	<i>Treron capellei</i>	1	u		94-00	NT	VU	1	2*			2			2										↓	
Aves	<i>Treron floris</i>	1	u		94-00	NT	VU	1	2			2			2*										↓	
Aves	<i>Treron psittaceus</i>	1	u		94-00	VU	EN	1	2			2			2								y		↓	
Aves	<i>Trichixos pyrropygus</i>	1	u		94-00	LC	NT	1	2*						2										↓	
Aves	<i>Turdinus atrigularis</i>	1	u		94-00	LC	NT	1	2*						2										↓	
Aves	<i>Turdus lherminieri</i>	1	u		94-00	NT	VU	2*		2	2	2								1					↓	
Aves	<i>Tympانuchus cupidio</i>	1	u		88-94	NT	VU	1																	↓	
Aves	<i>Tyto aurantia</i>	1	u		94-00	NT	VU	1	2*																↓	
Aves	<i>Vanellus gregarius</i>	1	u		00-04	EN	CR				1					2*									↓	
Aves	<i>Vermivora bachmanii</i>	1	u		88-94	CR	CR(PE)	1	2*																?	
Aves	<i>Xenoperdix udzungwensis</i>	1	u		00-04	VU	EN	2	2			1			2*			2							→	
Aves	<i>Zavattariornis stresemanni</i>	1	u		94-00	VU	EN	1					2*		2										↓	
Aves	<i>Zoothera dohertyi</i>	1	u		94-00	LC	NT	2*				1													↓	
Aves	<i>Zosterops conspicillatus</i>	3	u		00-04	LC	EN			1															↓	
Aves	<i>Zosterops natalis</i>	2	d	y	00-04	CR	VU			1				2											→	
Aves	<i>Zosterops natalis</i>	2	u		94-00	VU	CR			1				2											→	
Mammalia	<i>Abrothrix sanborni</i>	1	u		96-08	LC	NT		1																↓	
Mammalia	<i>Acerodon leucotis</i>	1	u		96-08	NT	VU	2*				1													↓	
Mammalia	<i>Addax nasomaculatus</i>	1	u		96-08	EN	CR	2*				1				2									↓	
Mammalia	<i>Allactaga vinogradovi</i>	1	u		96-08	LC	NT	1																	↓	
Mammalia	<i>Amorphochilus schnablii</i>	1	u		96-08	VU	EN						2*					1							↓	

				08																							
Mammalia	<i>Dasyurus hallucatus</i>	2	u		96-08	NT	EN		1																		↓
Mammalia	<i>Dasyurus viverrinus</i>	1	u		96-08	LC	NT		1											2*						→	
Mammalia	<i>Dendrolagus inustus</i>	1	u		96-08	NT	VU	2*																		↓	
Mammalia	<i>Dendrolagus lumholtzi</i>	1	d	y	96-08	NT	LC	1																		→	
Mammalia	<i>Dendrolagus scottae</i>	1	u		96-08	EN	CR	2*																		↓	
Mammalia	<i>Dendrolagus stellarum</i>	1	u		96-08	NT	VU										1		2							↓	
Mammalia	<i>Dendromus kahuziensis</i>	2	u		96-08	VU	CR	1	2										2*							↓	
Mammalia	<i>Dinomys branickii</i>	1	u		96-08	NT	VU	1									2*									↓	
Mammalia	<i>Dipodomys nitratoides</i>	1	u		96-08	NT	VU	1		2						2*										↓	
Mammalia	<i>Dorcopsis luctuosa</i>	1	u		96-08	NT	VU	2	2*							1										↓	
Mammalia	<i>Eidolon helvum</i>	1	u		96-08	LC	NT									1										↓	
Mammalia	<i>Enhydra lutris</i>	2	u		96-08	NT	EN									1				2						y →	
Mammalia	<i>Equus ferus</i>	1	d	y	96-08	EW	CR	2*								1											↑
Mammalia	<i>Equus hemionus</i>	2	u		96-08	NT	EN	2*								1											↓
Mammalia	<i>Falsistrellus mackenziei</i>	1	u		96-08	LC	NT		1							2*											↓
Mammalia	<i>Felis margarita</i>	1	u		96-08	LC	NT	1																		?	
Mammalia	<i>Gazella dorcas</i>	1	u		96-08	NT	VU	2*								1				2							↓
Mammalia	<i>Gazella spekei</i>	1	u		96-08	VU	EN	2*								1				2							↓
Mammalia	<i>Gazella subgutturosa</i>	1	u		96-08	NT	VU	2*								1				2							↓
Mammalia	<i>Gerbillus hesperinus</i>	1	u		96-08	VU	EN									1											↓
Mammalia	<i>Gorilla gorilla</i>	1	u		96-08	EN	CR		2							1	2*										↓
Mammalia	<i>Harpyionycteris celebensis</i>	1	u		96-08	NT	VU	2*	2							1											↓
Mammalia	<i>Hemigalus derbyanus</i>	1	u		96-08	NT	VU	1	1							2*											↓
Mammalia	<i>Hesperoptenus tomesi</i>	2	u		96-08	LC	VU	1	2*										2							↓	
Mammalia	<i>Hipposideros doriae</i>	1	u		96-08	LC	NT	1	2*										2							↓	
Mammalia	<i>Hydropotes inermis</i>	1	u		96-08	NT	VU	2*								1	2									↓	
Mammalia	<i>Hylobates agilis</i>	1	u		96-08	VU	EN	1								2*			2							↓	
Mammalia	<i>Hylobates albifrons</i>	1	u		96-08	VU	EN	1	2*							2										↓	
Mammalia	<i>Hylobates klossii</i>	1	u		96-08	VU	EN	2	2*							1										↓	
Mammalia	<i>Hylobates lar</i>	1	u		96-08	VU	EN	2*	2							1										↓	

				08																				
Mammalia	<i>Mysateles meridionalis</i>	1	u		96-08	EN	CR		2*		1													↓
Mammalia	<i>Nanger dama</i>	1	u		96-08	EN	CR	2*			1			2										↓
Mammalia	<i>Nasalis larvatus</i>	1	u		96-08	VU	EN	1 2*			2		2											↓
Mammalia	<i>Neophoca cinerea</i>	1	u		96-08	VU	EN											1						↓
Mammalia	<i>Neotoma palatina</i>	1	u		96-08	NT	VU											1						↓
Mammalia	<i>Nomascus concolor</i>	1	u		96-08	EN	CR	2* 2			1													↓
Mammalia	<i>Nomascus gabriellae</i>	1	u		96-08	VU	EN	2* 2			1													↓
Mammalia	<i>Nomascus leucogenys</i>	1	u		96-08	EN	CR	2* 2			1													↓
Mammalia	<i>Nycteris tragata</i>	1	u		96-08	LC	NT	1 2*					2											↓
Mammalia	<i>Nycticebus bengalensis</i>	1	u		96-08	NT	VU	1 2			2						2						y	↓
Mammalia	<i>Nycticebus coucang</i>	1	u		96-08	NT	VU	2*			1													↓
Mammalia	<i>Nycticebus javanicus</i>	2	u		96-08	NT	EN	2*			1													↓
Mammalia	<i>Nycticebus menagensis</i>	1	u		96-08	NT	VU	1			2*		2											↓
Mammalia	<i>Ochotona iliensis</i>	1	u		96-08	VU	EN	1					2*											↓
Mammalia	<i>Oryx dammah</i>	1	u		96-08	CR	EW	2*			1													n/a
Mammalia	<i>Otocolobus manul</i>	1	u		96-08	LC	NT	2*			1													↓
Mammalia	<i>Panthera pardus</i>	1	u		96-08	LC	NT				1													↓
Mammalia	<i>Pantholops hodgsonii</i>	1	u		96-08	VU	EN	2*			1													↓
Mammalia	<i>Pappogeomys alcorni</i>	1	u		96-08	EN	CR	1 2			2*													↓
Mammalia	<i>Pardofelis badia</i>	1	u		96-08	VU	EN	1 2*			2													↓
Mammalia	<i>Peroryctes broadbenti</i>	1	u		96-08	VU	EN	2*			1													↓
Mammalia	<i>Phalanger lullulae</i>	3	u		96-08	LC	EN	1																→
Mammalia	<i>Phalanger matanim</i>	1	u		96-08	CR	CR(PE)	2			2 2		1										y	?
Mammalia	<i>Phocarctos hookeri</i>	1	u		96-08	NT	VU			1								1						↓
Mammalia	<i>Phoniscus atrox</i>	1	u		96-08	LC	NT	1 2*					2											↓
Mammalia	<i>Pipistrellus murrayi</i>	1	u		96-08	EN	CR		1															↓
Mammalia	<i>Platyrrhinus chocoensis</i>	1	u		96-08	VU	EN	1																↓
Mammalia	<i>Presbytis melalophos</i>	1	u		96-08	VU	EN	1 2			2*													↓
Mammalia	<i>Presbytis potenziani</i>	1	u		96-08	VU	EN	2 1			2*													↓
Mammalia	<i>Presbytis siamensis</i>	1	u		96-08	LC	NT	1 2*			2													↓

				08																							
Mammalia	<i>Saimiri ustus</i>	1	u		96-08	LC	NT	2*	1																		↓
Mammalia	<i>Sarcophilus harrisii</i>	3	u		96-08	LC	EN			1									2*								↓
Mammalia	<i>Semnopithecus hypoleucus</i>	1	u		96-08	NT	VU	2*	2			1															↓
Mammalia	<i>Simias concolor</i>	1	u		96-08	EN	CR	2	2*			1															↓
Mammalia	<i>Sminthopsis aitkeni</i>	1	u		96-08	EN	CR	2		2*									1								↓
Mammalia	<i>Solomys ponceleti</i>	1	u		96-08	EN	CR		1				2*														↓
Mammalia	<i>Solomys salebrosus</i>	1	u		96-08	VU	EN		1				2*														↓
Mammalia	<i>Solomys sapientis</i>	1	u		96-08	VU	EN	2*	1			2														↓	
Mammalia	<i>Spermophilus suslicus</i>	1	d	y	96-08	VU	NT	1				2	2*														↓
Mammalia	<i>Spermophilus washingtoni</i>	1	d	y	96-08	VU	NT	1																			↓
Mammalia	<i>Spilocuscus kraemerii</i>	1	u		96-08	LC	NT	2*				1															↓
Mammalia	<i>Spilocuscus rufoniger</i>	1	u		96-08	EN	CR	2*	2			1															↓
Mammalia	<i>Spilocucus wilsoni</i>	1	u		96-08	EN	CR	2	1				2*														↓
Mammalia	<i>Spilogale pygmaea</i>	1	u		96-08	NT	VU			2		2	1							2					y	↓	
Mammalia	<i>Sus barbatus</i>	1	u		96-08	NT	VU	2*	2			1														↓	
Mammalia	<i>Sus celebensis</i>	1	u		96-08	LC	NT	2*	2			1														↓	
Mammalia	<i>Sympalangus syndactylus</i>	1	u		96-08	VU	EN	1	2				2*								2					↓	
Mammalia	<i>Tadarida johorensis</i>	1	u		96-08	NT	VU	1	2*										2							↓	
Mammalia	<i>Tadarida mops</i>	1	u		96-08	LC	NT	1	2*											2							↓
Mammalia	<i>Tapirus indicus</i>	1	u		96-08	VU	EN	1	2				2*														↓
Mammalia	<i>Tapirus terrestris</i>	1	u		96-08	NT	VU	2*				1														↓	
Mammalia	<i>Tarsius bancanus</i>	1	u		96-08	NT	VU	1	2			2			2									y	↓		
Mammalia	<i>Tayassu pecari</i>	1	u		96-08	LC	NT	2*				1														↓	
Mammalia	<i>Tokudai muenninki</i>	1	u		96-08	EN	CR		1	2*																↓	
Mammalia	<i>Trachypithecus cristatus</i>	1	u		96-08	LC	NT	1	2			2			2*											↓	
Mammalia	<i>Trachypithecus obscurus</i>	1	u		96-08	LC	NT	1					2*													↓	
Mammalia	<i>Tragulus nigricans</i>	1	u		96-08	VU	EN	2*				1														↓	
Mammalia	<i>Uromys neobritannicus</i>	1	u		96-08	LC	NT	1	2*	2		2														↓	
Mammalia	<i>Uromys rex</i>	1	u		96-08	VU	EN	1	1																	↓	
Mammalia	<i>Ursus maritimus</i>	2	u		96-08	LC	VU												1							↓	

Mammalia	<i>Vicugna vicugna</i>	1	d	y	96-08	NT	LC	2*				1													↑
Mammalia	<i>Viverra megaspila</i>	1	u		96-08	NT	VU	2*	2			1													↓
Mammalia	<i>Viverra zibetha</i>	1	u		96-08	LC	NT	2*	2			1													↓
Mammalia	<i>Vormela peregusna</i>	1	u		96-08	NT	VU	1				2*													↓
Mammalia	<i>Zalophus wollebaeki</i>	1	u		96-08	VU	EN			2*									1						↓
Mammalia	<i>Zyzomys maini</i>	1	u		96-08	LC	NT											1							↓
Mammalia	<i>Zyzomys pedunculatus</i>	1	u		96-08	CR	CR(PE)			2*							1	2							?

Table S7 Species showing a genuine improvement in IUCN Red List status in the absence of conservation actions. “No. cats changed” = total number of step-wise category changes; “Period” = the time period over which the change in status applies. IUCN Red List category abbreviations: EX, Extinct; CR(PE), Critically Endangered (Possibly Extinct); EW, Extinct in the Wild; CR(PEW), Critically Endangered (Possibly Extinct in the Wild); CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NR, Near Threatened; LC, Least Concern; DD, Data Deficient.

Class	Scientific name	No. cats changed	Period	Category at start of period	Category at end of period	Reason for change
Aves	<i>Myophonus robinsoni</i>	2	00-04	VU	LC	Plans for road construction shelved
Aves	<i>Nesocloepus woodfordi</i>	1	00-04	VU	NT	Neglect of plantations and mown areas during civil unrest led to increase in suitable grassland habitat
Aves	<i>Patagioenas inornata</i>	1	94-00	VU	NT	Increased food and nesting habitat availability following the recovery of second growth forests as marginally productive pasture and cropland have been abandoned
Aves	<i>Syphoetides indicus</i>	1	88-94	CR	EN	Rainfall increased

Table S8. Species showing genuine improvement in IUCN Red List status due to conservation and the conservation actions implemented that led to an improvement (1=major; 2=minor). “No. cats changed” = total number of step-wise category changes; “Period” = the time period over which the change in status applies. IUCN Red List category abbreviations: EX, Extinct; CR(PE), Critically Endangered (Possibly Extinct); EW, Extinct in the Wild; CR(PEW), Critically Endangered (Possibly Extinct in the Wild), CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern; DD, Data Deficient. Numbers in parentheses after drivers correspond to (S31). Note that many well-documented conservation successes are excluded, because their improvements took place before the time-periods considered here (e.g., Arabian Oryx *Oryx leucoryx*, Extinct in the Wild mid-1970s, reintroduced 1990, currently Endangered, although eligible for listing as Vulnerable in 2011; and White Rhinoceros *Ceratotherium simum*, Critically Endangered start of 20th Century at ~20-50 individuals, currently Near Threatened at ~17,500 in 2007).

Class	Sci name	No. cats changed	Up/down	y	Down owing to conservation?	Period	Actions implemented during period of change (1=major; 2=minor)																								
							Category at start of period	VU	Category at end of period	2	Site/area protection (1.1)	Habitat protection (1.2)	Site/area management (2.1)	Habitat management (2.3)	Invasive species control (2.2)	Native species control (2.2)	Harvest management (3.1)	Trade management (3.1)	Supplementary feeding (3.2)	Nest protection (3.2)	Nest provision (3.2)	Cross-fostering/brood manipulation (3.2)	Disease management (3.2)	- Reintroduction/introduction/translocation (3.3)	- Captive breeding (3.4)	Education & awareness (4.1)	International legislation (5.1)	National legislation (5.1)	Sub-national legislation (5.1)	Policies and regulations (5.2)	Private sector standards & codes (5.3)
Amphibia	<i>Alytes muletensis</i>	2	d	y	80-04	CR		VU		2																					
Amphibia	<i>Dendrobates azureus</i>	2	d	y	80-04	CR	VU																								
Amphibia	<i>Plethodon neomexicanus</i>	2	d	y	80-04	EN	NT			1																					
Amphibia	<i>Pleurodema kriegi</i>	2	d	y	80-04	EN	NT	1																							
Aves	<i>Acrocephalus rodéricanus</i>	1	d	y	94-00	CR	EN	1		1		2															2				
Aves	<i>Amazona brasiliensis</i>	1	d	y	00-04	EN	VU	1		2							1	1							2	2					
Aves	<i>Anodorhynchus leari</i>	1	d	y	00-04	CR	EN	1		2							1	1												2	

Aves	<i>Apteryx owenii</i>	1	d	y	00-04	VU	NT										1							
Aves	<i>Columba trocaz</i>	1	d	y	88-94	VU	NT		2			1							1			1		
Aves	<i>Copsychus sechellarum</i>	1	d	y	00-04	CR	EN		2	1		2	2	2			1	1		2	2			
Aves	<i>Crax blumenbachii</i>	1	d	y	94-00	CR	EN	2										1	1					
Aves	<i>Cyanoramphus cookii</i>	1	d	y	94-00	CR	EN			2			2											
Aves	<i>Dasyornis longirostris</i>	1	d	y	94-00	EN	VU	1	1									2						
Aves	<i>Dendroica kirtlandii</i>	1	d	y	88-94	VU	NT	2	1		2									2				
Aves	<i>Ducula galeata</i>	1	d	y	00-04	CR	EN					2					1	1	1					
Aves	<i>Ducula whartoni</i>	2	d	y	00-04	CR	VU	2	2	1														
Aves	<i>Falco punctatus</i>	1	d	y	88-94	CR	EN	2			2		2	2	2	2	1	1						
Aves	<i>Falco punctatus</i>	1	d	y	94-00	EN	VU	2					2											
Aves	<i>Foudia flavicans</i>	1	d	y	88-94	EN	VU	2	1	2									2					
Aves	<i>Foudia rubra</i>	1	d	y	94-00	CR	EN	2		1								2	2					
Aves	<i>Foudia sechellarum</i>	1	d	y	04-08	VU	NT		1									1						
Aves	<i>Gymnogyps californianus</i>	1	d	y	88-04	EW	CR	1											2	1				
Aves	<i>Haliaeetus albicilla</i>	1	d	y	94-00	NT	LC						2	1				2						
Aves	<i>Megapodius pritchardii</i>	1	d	y	00-04	CR	EN											1	1					
Aves	<i>Menura alberti</i>	1	d	y	04-08	VU	NT	1	2															
Aves	<i>Nesoenas mayeri</i>	1	d	y	88-94	CR	EN	1	1	1			1	1	1	1	1	1	1	1				
Aves	<i>Ninox natalis</i>	2	d	y	00-04	CR	VU	2	2	1														
Aves	<i>Nipponia nippon</i>	1	d	y	94-00	CR	EN	1	2				2	2	1				2	1				
Aves	<i>Ognorhynchus icterotis</i>	1	d	y	00-04	CR	EN	2*	2				2		2				1					
Aves	<i>Papasula abbotti</i>	1	d	y	00-04	CR	EN	2	2	1														
Aves	<i>Pelecanus crispus</i>	1	d	y	94-00	VU	NT	1	2						1	1			2					
Aves	<i>Phoenicoparrus jamesi</i>	1	d	y	94-00	VU	NT	1				1												
Aves	<i>Platalea minor</i>	1	d	y	94-00	CR	EN	1				2							2	2				
Aves	<i>Pomarea dimidiata</i>	1	d	y	88-94	CR	EN	1	1	1								2						
Aves	<i>Psittacula eques</i>	1	d	y	00-04	CR	EN	1	1	1	2		2	1	2	1	1	1	1					
Aves	<i>Pterodroma axillaris</i>	1	d	y	04-08	CR	EN	2	2	2	2		1		1			2						
Aves	<i>Pterodroma baraui</i>	1	d	y	94-00	CR	EN		2	2	1								2	1				
Aves	<i>Pterodroma cookii</i>	1	d	y	04-	EN	VU			2	1													

					08																					
Aves	<i>Puffinus opisthomelas</i>	1	d	y	00-04	VU	NT	2		2		1														
Aves	<i>Zosterops natalis</i>	2	d	y	00-04	CR	VU					1														
Mammalia	<i>Balaenoptera musculus</i>	1	d	y	96-08	CR	EN																		1	
Mammalia	<i>Bettongia lesueur</i>	2	d	y	96-08	EN	NT	1																1	1	
Mammalia	<i>Bison bonasus</i>	1	d	y	96-08	EN	VU																	1	1	
Mammalia	<i>Capra pyrenaica</i>	1	d	y	96-08	NT	LC	2	2	2	2			1												
Mammalia	<i>Capra walie</i>	1	d	y	96-08	CR	EN																2	2	2	
Mammalia	<i>Dasyurus geoffroii</i>	1	d	y	96-08	VU	NT				1	1											2	2	2	
Mammalia	<i>Dendrolagus lumholtzi</i>	1	d	y	96-08	NT	LC	1	2																2	
Mammalia	<i>Equus ferus</i>	1	d	y	96-08	EW	CR	1															1	1	2	
Mammalia	<i>Leontopithecus rosalia</i>	1	d	y	96-08	CR	EN			2													1	1		
Mammalia	<i>Leporillus conditor</i>	1	d	y	96-08	EN	VU	2															1	1		
Mammalia	<i>Macropus irma</i>	1	d	y	96-08	NT	LC					1														
Mammalia	<i>Megapitiera novaeangliae</i>	2	d	y	96-08	VU	LC																		1	
Mammalia	<i>Mustela nigripes</i>	2	d	y	96-08	EW	EN																1	1		
Mammalia	<i>Myotis emarginatus</i>	1	d	y	96-08	NT	LC																	2	1	
Mammalia	<i>Myotis grisescens</i>	1	d	y	96-08	VU	NT	1		1																
Mammalia	<i>Pseudochirulus cinereus</i>	1	d	y	96-08	NT	LC	1																		
Mammalia	<i>Pseudochirulus herbertensis</i>	1	d	y	96-08	NT	LC	1																		
Mammalia	<i>Pseudomys fieldi</i>	2	d	y	96-08	CR	VU																1	1		
Mammalia	<i>Pteropus samoensis</i>	1	d	y	96-08	VU	NT			2													1	1		
Mammalia	<i>Pteropus voeltzkowi</i>	2	d	y	96-08	CR	VU			2				1									1			2
Mammalia	<i>Rhinoceros unicornis</i>	1	d	y	96-08	EN	VU	1		1													2	2	2	2
Mammalia	<i>Spermophilus suslicus</i>	1	d	y	96-08	VU	NT	1															2	1		
Mammalia	<i>Spermophilus washingtoni</i>	1	d	y	96-08	VU	NT		1	1													2			
Mammalia	<i>Vicugna vicugna</i>	1	d	y	96-08	NT	LC	2	2	2	2											1	1		1	

Table S9. Species mentioned in the main text, with the associated reference to the species on the IUCN Red List.

Common Name	Scientific Name	Reference
Alaotra Grebe	<i>Tachybaptus rufolavatus</i>	BirdLife International 2009. <i>Tachybaptus rufolavatus</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
Asian Crested Ibis	<i>Nipponia nippon</i>	BirdLife International 2008. <i>Nipponia nippon</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
Black Stilt	<i>Himantopus novaezelandiae</i>	BirdLife International 2009. <i>Himantopus novaezelandiae</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3
Caribbean Monk Seal	<i>Monachus tropicalis</i>	Kovacs, K. 2008. <i>Monachus tropicalis</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3
Golden Lion Tamarin	<i>Leontopithecus rosalia</i>	Kierulff, M.C.M., Rylands, A.B. & de Oliveira, M.M. 2008. <i>Leontopithecus rosalia</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
Golden Toad	<i>Incilius periglenes</i>	Alan Pounds, Jay Savage, Federico Bolaños 2008. <i>Incilius periglenes</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3
Greater Red Musk Shrew	<i>Crocidura flavescens</i>	Baxter, R. 2008. <i>Crocidura flavescens</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
Hose's Broadbill	<i>Calyptomena hosii</i>	BirdLife International 2008. <i>Calyptomena hosii</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
Humpback Whale	<i>Megaptera novaeangliae</i>	Reilly, S.B., Bannister, J.L., Best, P.B., Brown, M., Brownell Jr., R.L., Butterworth, D.S., Clapham, P.J., Cooke, J., Donovan, G.P., Urbán, J. & Zerbini, A.N. 2008. <i>Megaptera novaeangliae</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
Kamao	<i>Myadestes myadestinus</i>	BirdLife International 2008. <i>Myadestes myadestinus</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3
Kihansi Spray Toad	<i>Nectophrynoides asperginis</i>	Channing, A., Howell, K., Loader, S., Menegon, M. & Poynton, J. 2009. <i>Nectophrynoides asperginis</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
Lear's Macaw	<i>Anodorhynchus leari</i>	BirdLife International 2009. <i>Anodorhynchus leari</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
Mallorcan Midwife Toad	<i>Alytes multensis</i>	Joan Mayol Serra, Richard Griffiths, Jaime Bosch, Trevor Beebee, Benedikt Schmidt, Miguel Tejedo, Miguel Lizana, Iñigo Martínez-Solano, Alfredo Salvador, Mario García-París, Ernesto Recuero Gil, Jan Willem Arntzen 2008. <i>Alytes muletensis</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3
Nightingale Reed-warbler	<i>Acrocephalus luscinius</i>	BirdLife International 2009. <i>Acrocephalus luscinius</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3
Rarotonga Monarch (Kakerori)	<i>Pomarea dimidiata</i>	BirdLife International 2008. <i>Pomarea dimidiata</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3
Red Fox	<i>Vulpes vulpes</i>	Macdonald, D.W. & Reynolds, J.C. 2008. <i>Vulpes vulpes</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
Salmon Shark	<i>Lamna ditropis</i>	Goldman, K., Kohin, S., Cailliet, G.M. & Musick, J.A. 2008. <i>Lamna ditropis</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3
Seychelles Magpie-robin	<i>Copsychus sechellarum</i>	BirdLife International 2008. <i>Copsychus sechellarum</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.

Tasmanian Devil	<i>Sarcophilus harrisii</i>	Hawkins, C.E., McCallum, H., Mooney, N., Jones, M. & Holdsworth, M. 2008. <i>Sarcophilus harrisii</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
Vicuña	<i>Vicugna vicugna</i>	Lichtenstein, G., Baldi, R., Villalba, L., Hoces, D., Baigún, R. & Laker, J. 2008. <i>Vicugna vicugna</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
White Rhinoceros	<i>Ceratotherium simum</i>	IUCN SSC African Rhino Specialist Group 2008. <i>Ceratotherium simum</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
Whooping Crane	<i>Grus americana</i>	BirdLife International 2008. <i>Grus americana</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.
Yangtze River Dolphin (Baiji)	<i>Lipotes vexillifer</i>	Smith, B.D., Zhou, K., Wang, D., Reeves, R.R., Barlow, J., Taylor, B.L. & Pitman, R. 2008. <i>Lipotes vexillifer</i> . In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3.

5 References and notes

- S1. A. S. L. Rodrigues, J. D. Pilgrim, J. F. Lamoreux, M. Hoffmann, T. M. Brooks, The value of the IUCN Red List for Conservation. *TREE* **21**, 71-76 (2006).
- S2. J. C. Vié, *et al.*, in *Wildlife in a Changing World: an analysis of the 2008 IUCN Red List of Threatened Species*, J. C. Vié, C. Hilton-Taylor, S. N. Stuart, Eds. (Lynx Edicions, Barcelona, 2009), pp. 1-14.
- S3. IUCN, *IUCN Red List of Threatened Species. Version 2010.3* (IUCN, 2010; <http://www.iucnredlist.org>).
- S4. S. N. Stuart *et al.*, Status and trends of amphibian declines and extinctions worldwide. *Science* **306**, 1783-1786 (2004).
- S5. S. N. Stuart, *et al.*, *Threatened Amphibians of the World* (Lynx Edicions, Barcelona, 2008).
- S6. J. Schipper *et al.*, The status of the world's land and marine mammals: diversity, threat, and knowledge. *Science* **322**, 225-230 (2008).
- S7. BirdLife International, *State of the World's Birds: indicators for our changing world* (BirdLife International, Cambridge, 2008).
- S8. K. E. Carpenter *et al.*, One-third of reef-building corals face elevated extinction risk from climate change and local impacts. *Science* **321**, 560-563 (2008).
- S9. N. Cumberlidge *et al.*, Freshwater crabs and the biodiversity crisis: Importance, threats, status, and conservation challenges. *Biol. Conserv.* **142**, 1665-1673 (2009).
- S10. B. Polidoro *et al.*, The loss of species: mangrove extinction risk and geographic areas of global concern. *PLoS One* **5**: e10095 (2010).
- S11. A. Farjon, C. N. Page, *Conifers: Status Survey and Conservation Action Plan* (IUCN/SSC Conifer Specialist Group, IUCN, Gland and Cambridge, 1999).
- S12. J. S. Donaldson, Ed., *Cycads. Status Survey and Conservation Action Plan* (IUCN/SSC Cycad Specialist Group, IUCN, Gland and Cambridge, 2003).
- S13. S. N. Stuart, E. O. Wilson, J. A. McNeely, R. A. Mittermeier, J.P. Rodriguez, The Barometer of Life. *Science* **328**, 177 (2010).

- S14. J. E. M. Baillie *et al.*, Towards monitoring global biodiversity. *Cons. Lett.* **1**, 18-26 (2008).
- S15. S. H. M. Butchart *et al.*, Measuring global trends in the status of biodiversity: Red List Indices for birds. *PLoS Biol.*, **2**, 2294–2304 (2004).
- S16. S. H. M. Butchart *et al.*, Improvements to the Red List Index. *PLoS One* **2**, e140 (2007).
- S17. V. Clausnitzer *et al.*, Odonata enter the biodiversity crisis debate: the first global assessment of an insect group. *Biol. Conserv.* **142**, 1864-1869 (2009).
- S18. B. Collen *et al.*, in *Wildlife in a Changing World: an analysis of the 2008 IUCN Red List of Threatened Species*, J. C. Vié, C. Hilton-Taylor, S. N. Stuart, Eds. (Lynx Edicions, Barcelona, 2009), pp. 67-77.
- S19. Turtle Taxonomy Working Group, turtles of the World: annotated checklist of taxonomy and synonymy, 2009 update, with conservation status summary. *Chelonian Res. Monogr.* **5** (2009).
- S20. N. A. Cox, H. J. Temple, *European Red List of Reptiles* (Office for Official Publications of the European Communities, Luxembourg, 2009).
- S21. N. Cox, J. Chanson, S. Stuart, *The Status and Distribution of Reptiles and Amphibians of the Mediterranean Basin* (IUCN, Gland and Cambridge, 2006).
- S22. W. R. T. Darwall, K. G. Smith, D. Tweddle, Eds., *The Status and Distribution of Freshwater Biodiversity in Southern Africa* (IUCN, Gland, 2009).
- S23. W. Darwall, K. Smith, T. Lowe, J.C. Vié, *The Status and Distribution of Freshwater Biodiversity in Eastern Africa* (IUCN, Gland and Cambridge, 2005).
- S24. K. G. Smith, M. D. Diop, M. Niane, W. R. T. Darwall, *The Status and Distribution of Freshwater Biodiversity in Western Africa* (IUCN, Gland and Cambridge, 2009).
- S25. K. G. Smith, W. R. T. Darwall, *The Status and Distribution of Freshwater Fish Endemic to the Mediterranean Basin* (IUCN, Gland and Cambridge, 2006).
- S26. IUCN, *Red List assessment of Madagascar's Freshwater Fishes* (IUCN, Gland, 2004).
- S27. M. Kottelat, J. Freyhof, *Handbook of European Freshwater Fishes* (Kottelat, Cornol and Freyhof, Berlin, 2007).
- S28. IUCN, *IUCN Red List Categories and Criteria: Version 3.1* (IUCN Species

Survival Commission, IUCN, Gland and Cambridge, 2001).

S29. G. M. Mace *et al.*, Quantification of extinction risk: the background to IUCN's system for classifying threatened species. *Cons. Biol.* **22**, 1424-1442 (2008).

S30. IUCN Standards and Petitions Subcommittee, *Guidelines for Using the IUCN Red List Categories and Criteria. Version 8.0* (Standards and Petitions Subcommittee, 2010; <http://intranet.iucn.org/webfiles/doc/SSC/RedList/RedListGuidelines.pdf>).

S31. N. Salafsky *et al.*, A standard lexicon for biodiversity conservation: unified classifications of threats and actions. *Cons. Biol.* **22**, 897-911 (2008).

S32. D. M. Olson *et al.*, 2001. Terrestrial ecoregions of the world: A new map of life on Earth. *BioScience* **51**, 933-938 (2001).

S33. J. Lamoreux *et al.*, Value of the IUCN Red List. *TREE* **18**, 214-215 (2003).

S34. P. C. De Grammont, A. D. Cuarón, An evaluation of threatened species categorization systems used on the American Continent. *Cons. Biol.* **20**, 14-27 (2006).

S35. M. Hoffmann *et al.*, Conservation planning and the IUCN Red List. *Endang. Spec. Res.* **6**, 113-125 (2008).

S36. S. H. M. Butchart, A. J. Stattersfield, T. M. Brooks, Going or gone: defining 'Possibly Extinct' species to give a truer picture of recent extinctions. *Bull. B.O.C.* **126A**, 7-24 (2006).

S37. J. Köhler, G. Glaw, M. Vences, in *Threatened Amphibians of the World*, S. N. Stuart *et al.*, Eds. (Lynx Edicions, Barcelona, 2008), pp. 18.

S38. F. Glaw, J. Kohler, I. de la Riva, D. R. Vieites, M. Vences, Integrative taxonomy of Malagasy treefrogs: combination of molecular genetics, bioacoustics and comparative morphology reveals twelve additional species of *Boophis*. *Zootaxa* **2383**, 1-82 (2010).

S39. A. H. Hulbert, W. Jetz, Species richness, hotspots, and the scale dependence of range maps in ecology and conservation *Proc. Natl. Acad. Sci. U.S.A.* **104**, 13384-13389 (2007).

S40. S. H. M. Butchart, J. P. Bird, Data Deficient birds on the IUCN Red List: What don't we know and why does it matter? *Biol. Cons.* **143**, 239-247 (2010).

S41. W. Darwall *et al.*, in *Wildlife in a Changing World: an analysis of the 2008 IUCN Red List of Threatened Species*, J. C. Vié, C. Hilton-Taylor, S. N. Stuart, Eds. (Lynx Edicions, Barcelona, 2009), pp. 43-53.

S42. N. K. Dulvy, Y. Sadovy, J. D. Reynolds, Extinction vulnerability in marine

- populations. *Fish and Fisheries* **4**, 25-64 (2003).
- S43. K. Sahr, D. White, A. J. Kimerling, Geodesic Discrete Global Grid Systems. *Cart. Geog. Inf. Sci.* **30**, 121-134 (2003).
- S44. C. P. Birch, S. P. Oom, J. A. Beecham, Rectangular and hexagonal grids used for observation, experiment and simulation in ecology. *Ecol. Model.* **206**, 347–359 (2007).
- S45. W. Jetz, C. Rahbek, Geographic range size and determinants of avian species richness. *Science* **297**, 1548-1551 (2002).
- S46. J. J. Lennon, K. J. Gaston, P. Koleff, J. J. D. Greenwood, Contribution of rarity and commonness to patterns of species richness. *Ecol. Lett.* **7**, 81-87 (2004).
- S47. Secretariat of the Convention on Biological Diversity, *Global Biodiversity Outlook 3* (Convention on Biological Diversity, Montréal, 2010).
- S48. S. H. M. Butchart *et al.*, Global biodiversity: indicators of recent declines. *Science* **328**, 1164-1168 (2010).
- S49. UN, *The Millennium Development Goals Report 2009* (UN, New York, 2009; www.un.org/millenniumgoals/.../MDG%20Report%202009%20ENG.pdf).
- S50. N. J. Collar, P. Andrew, *Birds to Watch: the ICBP world check-list of threatened birds* (ICBP Technical Publication 08, International Council for Bird Preservation, Cambridge, 1988).
- S51. N. J. Collar, M. J. Crosby, A. J. Stattersfield, *Birds to Watch 2: the world list of threatened birds* (BirdLife Conservation Series 04, BirdLife International, Cambridge, 1994)
- S52. BirdLife International, *Threatened Birds of the World* (Lynx Edicions and BirdLife International, Barcelona and Cambridge, 2000).
- S53. BirdLife International, *Threatened Birds of the World* (BirdLife International, Cambridge, 2004)
- S54. BirdLife International, *2010 IUCN Red List of Threatened Birds* (BirdLife International, Cambridge, 2010; <http://www.birdlife.org/datazone/species/index.html>).
- S55. J. Baillie, B. Groombridge, Eds., *1996 IUCN Red List of Threatened Animals* (IUCN, Gland and Cambridge, 1996).
- S56. J. Bielby, N. Cooper, A. A. Cunningham, T. W. J. Gardner, A. Purvis, Predicting susceptibility to future declines in the world's frogs. *Cons. Lett.* **1**, 82-90 (2008).

- S57. S. H. M. Butchart, A. J. Stattersfield, N. J. Collar, How many bird extinctions have we prevented? *Oryx* **40**, 266-278 (2006)
- S58. M. A. McGeoch *et al.*, Global indicators of biological invasion: spread, biodiversity impact, and policy responses. *Divers. & Distrib.* **16**, 95-108 (2010).
- S59. S. H. M. Butchart, Red List Indices to measure the sustainability of species use and impacts of invasive alien species. *Bird Cons. Intl.* **18**, S245-S262 (2008).
- S60. D. E. Wilson, D. M. Reeder, Eds., *Mammal Species of the World. A Taxonomic and Geographic Reference. Third edition* (Johns Hopkins University Press, Baltimore, 2005).
- S61. D. M. Reeder, K. M. Helgen, D. E. Wilson, Global trends and biases in new mammal species discoveries. *Occas. Papers., Mus. Tex. Tech. Univ.* **269**, 1-35 (2007).
- S62. BirdLife International, *The BirdLife Checklist of the Birds of the World, with conservation status and taxonomic sources. Version 3* (BirdLife International, Cambridge, 2010; http://www.birdlife.org/datazone/species/downloads/BirdLife_Checklist_Version_3.zip).
- S63. D. R. Frost, *Amphibian Species of the World: an Online Reference. Version 5.4* (American Museum of Natural History, New York, 2010; <http://research.amnh.org/vz/herpetology/amphibia/>).
- S64. P. Uetz, *et al.*, *The Reptile Database* (2009; <http://www.reptile-database.org>).
- S65. L. J. V. Compagno, in *Sharks, Rays and Chimaeras: the Status of the Chondrichthyan Fishes*, S. L. Fowler *et al.*, Eds. (IUCN/SSC Shark Specialist Group, Gland, Switzerland, 2005), pp. 401-423.
- S66. W. N. Eschmeyer, Ed., *Catalog of Fishes electronic version* (2010; <http://research.calacademy.org/ichthyology/catalog/fishcatmain.asp>)

6 Acknowledgements

6.1 General

The IUCN Red List of Threatened Species™ is compiled and produced by the IUCN Species Programme based on contributions from a network of thousands of scientific experts around the world. These include members of the IUCN Species Survival Commission Specialist Groups, Red List Partners (currently Conservation International, BirdLife International, NatureServe, the Zoological Society of London, Botanic Gardens Conservation International, Royal Botanic Gardens, Kew, WildScreen, Texas A&M University and Department of Animal and Human Biology, Sapienza University of Rome), and many others including experts from universities, museums, research institutes and non-governmental organizations.

Compilation and production of The IUCN Red List of Threatened Species™ would not be possible without the financial support of many donors. We would like to thank all the donors who have generously provided funds to support this work, and in particular would like to acknowledge: the Moore Family Foundation; the Gordon and Betty Moore Foundation; the Critical Ecosystem Partnership Fund; the European Commission; the Esmée Fairburn Foundation; the French Ministry for Foreign Affairs (DgCiD – Direction générale de la Coopération Internationale et du Développement); the MAVA Foundation for Nature Conservation (MAVA Stiftung für Naturschutz / Fondation pour la Protection de la Nature); the Rufford Maurice Laing Foundation; and Tom Haas and the New Hampshire Charitable Foundation. Further details about the specific contributions of these and other donors are included under the sections below for the individual datasets.

To improve and expand the Red List assessment process, further development of the tools used is required. In order to support the new developments an IUCN Red List Corporate Support Group has been established. IUCN would like to acknowledge those organizations that have become members of the support group: Chevron, Electricité de France, Holcim, Oracle, Statoil, and Shell.

We gratefully acknowledge advice and help received from the following individuals: Mark Balman, Emma Brooks, Robert Holland, Ian May, Rebecca Miller, and Ben Sullivan. A particular debt is due Rebecca Miller and Maiko Lutz who helped compile the list of IUCN Red List contributors. As always, staff in the IUCN Species Programme and SSC Chair's office provided invaluable support: Amy Burden; Dena Cator; Julie Griffin; Jeremy Harris; Rachel Roberts; Hugo Ruiz Lozano; Claire Santer; and Doreen Zivkovic. We also wish to acknowledge the insightful comments received from two anonymous reviewers as well as from the editor, which greatly improved the quality of the overall manuscript.

Michael Hoffmann was funded by the Al Ain Wildlife Park and Resort and WCMC.

6.2 Datasets

Mammals

Institutional Support

The first major comprehensive assessment of the world's mammals was completed in October 2008 (unless otherwise noted, all acknowledgements that follow refer specifically to this project). The achievement would not have been possible without the generous support of numerous partner organizations. The International Union for Conservation of Nature (IUCN) and Conservation International (CI) led this effort and provided significant direct support throughout. Both CI and IUCN shared in equipping, housing, and staffing the project during its various phases. We gratefully acknowledge the support of the Gordon and Betty Moore Foundation and the Moore Family Foundation, which provided core funding to CI, supporting workshops, staff salaries, and day-to-day operations. Special thanks are due to the Critical Ecosystem Partnership Fund (CEPF), providing as it did the initial funding to employ a full-time project manager, enabling the project to get underway. Jorgen Thomsen, Donnell Ocker, Bobbie Jo Kelso, Dan Martin, and Michele Zador facilitated this support.

Among partner organizations, the Instituto di Ecologia Applicata (IEA) received major support from the European Commission and from within the IUCN Species Survival Commission (SSC) network. This resulted in seven workshops in Southeast Asia. Major support to the Sapienza Università di Roma came from unrestricted research funds granted to several authors. We especially thank them for their unfailing contributions to the IUCN Red List assessments of the mammals, and for providing much staff time.

Texas A&M University and Texas A&M AgriLife Extension provided major support for both staff salaries and participation in workshops. At Arizona State University, the School of Life Sciences, Global Institute of Sustainability, Center for Biology and Society, College of Liberal Arts and Sciences, and Vice-president for Research and Economic Affairs provided significant financial contributions. We also acknowledge the University of Virginia (UVA) for its financial support of the project when it was based in its Department of Environmental Sciences.

Workshop Donors

We conducted 28 workshops, each contingent upon financial support of donors. We acknowledge these donors, as well as those individuals (in parentheses) who helped facilitate grant acquisition. We also express our utmost gratitude to all of the IUCN/SSC Specialist Groups for mammals, members of which participated in the workshops and were responsible for coordinating assessments for their respective species groups (see http://iucn.org/about/work/programmes/species/about_ssc/specialist_groups/directory_specialist_groups/directory_sg_mammals/). The Africa workshops for small mammals were supported by CEPF, Elsevier (Andy Richford), the US Agency for International Development's (USAID) Central African Regional Program for the Environment (CARPE) (Juan Carlos Bonilla and John Flynn), and IEA. African primates were assessed with support from CARPE, while the Margot Marsh Biodiversity Foundation

(Bill Konstant) and Disney's Animal Programs (Anne Savage) supported the assessment workshops for both African and Neotropical primates. The mammals of Madagascar were assessed with support from the CI-Madagascar Center for Biological Conservation (CBC) (Leon Rajaobelina and Frank Hawkins).

Southwest Asian mammals were assessed with financial support from CEPF. Mongolian mammal assessments were conducted with funds provided by the World Bank's Netherlands-Mongolia Trust Fund for Environmental Reform, Zoological Society of London (ZSL), the National University of Mongolia, the Mongolian Academy of Sciences, the Ministry of Nature and Environment – Mongolia, IUCN, the Wildlife Conservation Society (WCS), the Darwin Initiative, Denver Zoo, World Wildlife Fund, the University of Nebraska, and Hustai National Park. A workshop in South Asia to assess non-volant small mammals was supported by the Zoo Outreach Organisation (ZOO), India.

Numerous workshops (including those for the small carnivores and Asian primates) were conducted across Southeast Asia and the Philippines, led by IEA through the Southeast Asia Mammal Databank (SAMD) project that was co-funded by the European Commission (EC). The mammals of Japan were assessed with funds from Switzerland's Office Fédéral de l'Environnement (OFEV). The assessments of the mammals of Australia, Melanesia, and the Pacific Islands were made possible by the Australian Wildlife Conservancy (Atticus Fleming) and CI-Melanesia CBC (François Martel, Bruce Beehler, and Gaikovina Kula).

European Mammals were assessed by a sister project — the European Mammal Assessment (EMA) — at a regional workshop funded by the EC and the Austrian Federal Ministry of Agriculture, Forestry Environment, and Water. The full list of acknowledgements for the EMA is available online: <http://ec.europa.eu/environment/nature/conservation/species/ema/acknowledge.htm>.

Small mammals of the Andes were assessed with support from CI's Andes CBC. Mesoamerican and Caribbean small mammals were assessed with support from CEPF, CI, the United States Fish and Wildlife Service, the Lubee Foundation (Allyson Walsh), and El Centro Zamorano de Biodiversidad. Small mammals from the Southern Cone were assessed with support from the US Department of State Voluntary Contribution to IUCN. The Brazil and Guianas' workshop (i.e., Amazonian small mammals) and the edentates workshop were financed by CI's Brazil-Guianas CBC.

The cetacean workshop was funded by CI's Global Marine Program (Roger McManus), SeaWorld & Busch Gardens Conservation Fund, the US Marine Mammal Commission, and the United States Voluntary Contribution to IUCN. We also recognize the financial contribution of the US Marine Mammal Commission and CI's Global Marine Program to the pinniped assessments, and for supporting the Sirenia workshop. The cat workshop was made possible by a generous contribution from the Panthera Foundation (Tom Kaplan).

We acknowledge the IUCN/SSC Conservation Breeding Specialist Group (CBSG) and 150 conservation organizations worldwide that have provided institutional and/or financial support to conduct Population and Habitat Viability Assessment (PHVA) Workshops for the four species of tapir between 2003 and 2007. In addition, assessments of Mexican lagomorphs were provided by The Mexican Association for the Study and Conservation of Lagomorphs (AMCELA).

The EC provided support for the assessment of European species. Funding for the Mediterranean workshop was kindly provided by the MAVA foundation (Luc Hoffmann, Holger Schmid).

We are grateful to Switzerland's Office Fédéral de l'Environnement (OFEV), in particular Olivier Biber, and to the US State Department which provided financial support at a very crucial stage of the process.

Conservation Partners

The first comprehensive assessment of the threatened status of the class Mammalia was made possible not only by funding, but by a network of partnerships between institutions and individuals. A huge debt is owed to the IUCN Species Programme staff who supported the project. We particularly thank Dena Cator, Mariano Gimenez-Dixon, Julie Griffin, Bryan Hugill, Lynette Lew, Hugo Ruiz Lozano, Arturo Mora, Claire Santer, and Doreen Zivkovic for both administrative and technical support. We would also like to acknowledge the invaluable assistance provided by Daniel Absolon, Richard Berridge, Roselle Chapman, Charlotte Johnston, Zoe Macavoy, Meghan McKnight, Monik Oprea, Abigail Powel, Yelizaveta Protas, and Pavithra Ramani. Thanks are also due to Susannah O'Hanlon and Leah Collett, as well as IUCN volunteers Philip Martin and James Beresford, who provided much-needed GIS support in the final stages of the project.

At CI, we thank the following people for providing support, advice and coordination: Jim Barborak, Daniel Brito, Don Church, Jaime García-Moreno, Ruth Grace Rosell-Ambal, Roger James, Jill Lucena, Laara Manler, Carlos Manuel-Rodriguez, Ella Outlaw, Conrad Savy, and Will Turner. We are particularly grateful to Noura Bakkour, Naamal de Silva, Matt Foster, David Knox, Kellee Koenig, Penny Langhammer, and Sarah Wyatt for help facilitating at workshops.

For several years the mammal assessment was housed at UVA through a Memorandum of Understanding signed between CI and then Vice President for Research and Graduate Studies at UVA, Ariel Gomez, to whom we are most grateful for his hospitality. Wes Sechrest served as overall project manager from late 2003 until late 2006, with Hank Shugart providing day-to-day oversight. Wes Sechrest's thesis map data formed the starting point for the mammal assessment. We thank John Gittleman for his leadership in acquiring the necessary funds and students to develop the first versions of the maps, and recognize Kate Jones for her early work in coordinating the production of numerous maps for bats. We also acknowledge the efforts of the staff and consultants who worked on the project while based at UVA, including Sabrina Foster, Tatjana Good, Mandy Haywood, Mark Keith, Monica Rulli, Simona Savini, Cody Schank, and Diego Tirira.

Cindy Allen, Sarah Alspaugh, Michael Erwin, Lyndon Estes, Lelia Gibson, Jann Goetzman, James Green, Pam Hoover, Mike Knetzger, Grace Lipscomb, Steve Macko, Carleton Ray, Robert Swap, Sam Truslow, Henry White, Jack Wisman, Charlotta Wriston, and Joseph Ziemen provided intellectual input and technical support. A special word of thanks is due to Jennifer Law and Tamar Samuel Siegel for their assistance in keeping the project running, and to Will Tomanek and Robert Washington-Allen, who helped in problem solving and computer applications.

The taxonomic foundation of the mammals on the IUCN Red List, as mentioned elsewhere, owes much to the efforts of the editors and authors of the 3rd edition of *Mammal Species of the World* (MSW). We are most grateful to Don Wilson, DeeAnn Reeder, Nancy Simmons, Guy Musser, Michael Carleton, Sydney Anderson, Richard Thorington, Jr., Robert Voss and to the other authors who provided advanced drafts of their manuscripts and species lists that proved so useful at the beginning stages of the project (2003 to 2004). We also take this opportunity to pay tribute to the late Jeheskel (Hezy) Shoshani, Peter Grubb, Robert Hoffmann, and W. Chris Wozencraft, all MSW authors and active members of IUCN/SSC Specialist Groups, sadly no longer with us. We also acknowledge Andrew Smith and Xie Yan (Chinese Species Information Service) for making available pre-publication texts and maps of the *Mammals of China*, and the editors of the *Mammals of Africa* (including Jonathan Kingdon, Tom Butynski, and David and Meredith Happold) for doing likewise.

A special debt of thanks is due to Kris Helgen who provided unparalleled taxonomic guidance and advice throughout the project and whose knowledge on Melanesian mammals was invaluable. We thank Sam Turvey for making unpublished data available at critical periods particularly based on his work on Holocene mammal extinctions and for support of the assessment process at workshops.

IEA and the Department of Human and Animal Biology at Sapienza Università di Roma formed the SAMD project, which partnered with this project to share data and funding. The partnership was supported by The ASEAN Center for Biodiversity, Institute of Biology of the University of the Philippines – Diliman, Indonesian Institute of Sciences (LIPI), and the Vietnamese Institute of Ecology and Biological Resources.

We thank several colleagues for numerous stimulating discussions at various phases of the project, and for technical inputs and advice, including Ken Aplin, Kaycie Billmark, Olaf Bininda-Emonds, Chris Carbone, Marcel Cardillo, Justin O'Dell, Eric Dinerstein, Richard Estes, Darrin Lunde, Charlie Nunn, John Morrison, John Pilgrim, Robert Pressey, Samantha Price, Andy Purvis, and Ronald Strahan.

Ana Rodrigues was funded by a Fundação para a Ciência e Tecnologia Postdoctoral Fellowship (Portugal). Jan Schipper and Beth Polidoro were partially funded by NSF-IGERT Grant No. 0114304. Patricia Moehlman thanks TAWIRI, Tanzania, EWCO, Ethiopia, and the Ministry of Agriculture, Eritrea.

Workshops were kindly hosted by the following institutions (geographic or taxonomic

groups of mammals assessed are in parentheses): ZSL (African small mammals), CI-Brazil-Guianas CBC (edentates), Disney's Animal Programs (African and Neotropical primates), CI-Madagascar CBC (Madagascar), 9th International Mammalogical Congress (Sirenia), CI-Japan (Japan), South Australian Museum (Australia/Pacific), Fundação Biodiversitas (Brazil/Guianas and Southern Cone), Hustai National Park (Mongolia), IEA (Southeast Asian small mammals), Doğa Derneği (Southwest Asia), El Instituto Alexander von Humboldt (Andes), the Wildlife Conservation Society of the Philippines, CI-Philippines, and the Katala Foundation (Philippines), CI-Indonesia (Southeast Asian large mammals and bats), the American Museum of Natural History, New York (Southeast Asian rodents), Cuc Phuong National Park and Owston's Civet Conservation Program (small carnivores), CI-Indo-Burma (Asian primates), IUCN Centre for Mediterranean Cooperation (Mediterranean), the Scripps Institution of Oceanography and Southwest Fisheries Science Center, the US National Oceanic and Atmospheric Administration, the US National Marine Fisheries Service (cetaceans), the Wildlife Conservation Research Unit at Oxford University (cats), and the Escuela Agrícola Panamericana, Carrera de Desarrollo Socioeconómico y Ambiente, and El Centro Zamorano de Biodiversidad (Mesoamerican, Mexican and Caribbean small mammals).

The following non-staff people provided local logistical support or helped facilitate at the assessment workshops: Jon Bielby, Zoe Cokeliss (African small mammals); Jon Bielby (South Asia); Adriano Paglia (edentates); Jeanne Ford, Katie Leighty, Kim Sams, Anne Savage (African primates and Neotropical primates); Monica Masi (Southeast Asia – initial assessment workshop); Indira Lacerna, Jeanne Tabangay, Peter Widmann (Philippines); Harison Randrianasolo (Madagascar); Cyndi Taylor (Sirenia); Yasushi Hibi, Wakako Ichikawa, Hiromi Tada (Japan); John Pilgrim (Australia/Pacific); Jon Bielby (Southwest Asia); Güven Eken, Kerem Boyla (Southwest Asia); Darrin Lunde (Southeast Asian rodents); Scott Roberton, Tran Quang Phuong (small carnivores); Olivia Bittencourt, Gláucia Drummond, Eduardo Du Figueiredo, Maria Aparecida da Costa, Helder Galvão Pereira (South American small mammals); Martua Sinaga, Maria Elisa Hobbelink (Southeast Asian large mammals and bats); Jake Brunner, Anthony Simms, Un Nalene (Asian primates); Sarah Mesnick, Autumn-Lynn Harrison (cetaceans); Richard Mercer, Andrew Loveridge, Alexandra Zimmermann (cats); Jorge Ivan Restrepo, Suyapa Triminio Meyer, Jose-Fernando Gonzalez-Mayo (Mesoamerican, Mexican and Caribbean small mammals); and Jose-Fernando Gonzalez-Mayo (Southern Cone).

The concept of this project arose from a working group and workshop hosted by the National Center for Ecological Analysis and Synthesis (University of California, Santa Barbara) entitled “Towards a Global Database of Terrestrial Vertebrate Distributions, Mammals Subgroup”, February 4-7, 2002.

Amphibians

Institutional support

The Moore Family Foundation and the Gordon and Betty Moore Foundation, through Conservation International, have provided the core financial support to date for the

amphibian assessments. The MAVA Foundation, the US Department of State, the Regina Bauer Frankenberg Foundation for Animal Welfare, the National Science Foundation (DEB-0130273 and INT-0322375), the Critical Ecosystem Partnership Fund (CEPF), George Meyer, the European Commission, Ben Hammett, and the Disney Foundation provided additional major support. Jorgen Thomsen, in particular, assisted with fundraising during the early stages of the first assessment.

Workshop donors

We are grateful for the support of WWF - Australia for supporting the assessment of Australian amphibians. The workshop covering China and the Koreas was kindly supported by The Kadoorie Farm and Botanic Garden, the Society for Wildlife and Nature, and the Taipei Zoological Foundation.

South Asian amphibians were assessed through a joint CBSG CAMP workshop funded by CEPF, the Chicago Zoological Society and Columbus Zoo. CEPF also funded the assessment of Southeast Asian amphibians.

Conservation International's Center for Applied Biodiversity Science provided support to workshops throughout the project, and CI's Melanesia, Brazil, Andean and Madagascar regional offices kindly supported workshops covering the Papuan region, South America (east of the Andes), the Andes and Madagascar, respectively. Additional support for the workshops in Mesoamerica and in the Caribbean was received from the US Department of State. NatureServe provided support to the workshop covering Costa Rican amphibians.

Core support to the IUCN Centre for Mediterranean Cooperation enabling the assessment of Mediterranean species was provided by the Ministry of the Environment and Rural and Marine Affairs, as well as the Junta de Andalusia.

The European Reptile and Amphibian Assessments were funded through the European Commission (Service Contract No.070307/2007/483288/MAR/B2). Additional support to IUCN that contributed to the success of the workshop was provided by CEPF.

Conservation partners

Special mention must be made of George Rabb, who was the first to recognize the enormity of the global amphibian conservation crisis, and who has mobilized both scientists and conservationists to address this challenge.

Darrel Frost of the American Museum of Natural History has provided extensive assistance on taxonomic and nomenclatural issues, and his remarkable *Amphibian Species of the World* remains the taxonomic backbone of the amphibian assessments. David Wake of the Museum of Vertebrate Zoology at the University of California at Berkeley gave us privileged access to the AmphibiaWeb database. We are most grateful to both of these experts for their unfailing and continued support.

We received assistance and advice in ways too numerous to mention from the IUCN/SSC Amphibian Specialist Group (and the former IUCN/SSC Declining Amphibian Populations Task Force), in particular from Don Church, Jim Collins, Tim Halliday, Jim Hanken, Jeanne McKay, Robin Moore and John Wilkinson.

Workshops were kindly hosted by the following institutions: the Bishop Museum (Papuan region); CI – Brazil (Brazil); CI – Ecuador (Andes); IUCN (Madagascar); the British Museum of Natural History (Caecilians); Colegio de la Frontera Sur (Mexico); Museo de Zoología, Universidad de Costa Rica (Costa Rica); and Doğa Derneği (Turkey).

The following people provided local logistical support for workshops: Zhong Shengxian (China); Barasa Johnson (Kenya); Sally Walker (India); Rosa Mary Saengsanthitham (Thailand); Enrique Lahmann and Ana Virginia Mata (Costa Rica); Sabrina Cowan and Allen Allison (Hawaii); Adriano Paglia, Jose Maria Cardoso da Silva and Luis Paulo de Souza Pinto (Brazil); Paul and Sara Salaman and José Vicente Rodríguez (Ecuador); Doreen Zivkovic (Switzerland); Juan Carlos Ortiz (Chile); Sixto Inchaustegui (Dominican Republic); Sonsoles San Román and Jamie Skinner (Spain); Yolanda Matamoros and Jorge Rodríguez (Costa Rica); and Özge Balkız and Özgür Koç (Turkey). Melanie Bilz, Don Church, Matt Foster, David Knox, Penny Langhammer, Meghan McKnight, Ana Nieto, and Sarah Wyatt assisted in facilitating working groups during workshops.

Don Church and Allison Parker did a very large amount of work locating missing bibliographic references and entering them into the database. Noura Bakkour, Laara Manler and Andrew Mitchell provided important logistical and administrative support. The distribution maps used for U.S. species were adapted from several sources, including NatureServe's Central Databases and the United States Amphibian Atlas Database. The NatureServe data were developed in collaboration with its Natural Heritage member programmes, a leading source of information about rare and endangered species, and threatened ecosystems. The United States Amphibian Atlas Database was compiled at Ball State University by Priya Nanjappa, Laura M. Blackburn, and Michael J. Lannoo and supported in part by grants and/or matching funds from the National Fish and Wildlife Foundation, United States Fish and Wildlife Service, and Disney Wildlife Conservation Fund. John Pilgrim worked diligently on adding many of the amphibians that were described between the 2004 and 2006 release of the data, including creating range maps for each of these species. Robert Waller, Mark Denil, Debra Fischman, and Kellee Koenig provided extensive, high-quality GIS support.

Birds

Institutional support

BirdLife wishes to acknowledge and thank its Founder Patrons, the Aage V. Jensen Charity Foundation, the Olewine family, A. P. Leventis Foundation, the British Birdwatching Fair, all BirdLife Species Champions and numerous other supporters of its science and conservation programmes. For a full list, see BirdLife International (2000,

2004, 2008).

Conservation partners

We wish to acknowledge the following individuals:

Editors, compilers and evaluators: Phil Benstead, Rob Calvert, Rob Clay, Jonathan Ekstrom, Mike Evans, Stephen Garnett, James Gilroy, Matt Harding, Simon Mahood, Deon Nel, John Pilgrim, Rob Pople, and Joe Taylor.

Data management: Mark Balman, Mike Evans, Ian Fisher, Ian May and Martin Sneary.

Additional contributors: Christine Alder, Mark Balman, Andy Black, Rob Clay, Lorna Collins, John Croxall, Amy Crossley, Lincoln Fishpool, Stephen Garnett, Matt Harding, Ben Lascelles, Lucy Malpas, Rory McCann, Simon Mitchell, Pete Newton, Lotty Packman, Jenny Peters, Rob Pople, Louisa Richmond-Coggan, Andrea Santangeli, Judith Schleicher, John Sherwell, Sue Shutes, Cleo Small, Ben Sullivan, Ellen Walford, and Hugh Wright.

Information was contributed through Globally Threatened Bird forums which were kindly moderated by: Sharif Al Jbour, Maria Bellio, Greg Butcher, Rob Clay, Simba Chan, David Diaz, Steven Evans, Umberto Gallo-Orsi, Stephen Garnett, Adrian di Giacomo, Jaimie Gilardi, Bennett Hennessey, Eduardo Iñigo-Elias, Andre de Luca, Prashant Mahajan, James Millett, Szabolcs Nagy, Paul Kariuki Ndang'ang'a, Deon Nel, Fabio Olmos, John Pilgrim, Rob Pople, Ken Rosenberg, and Eric Vanderwerf.

Collaborating individuals and organisations who generously shared data and information included: Nicholas Macgregor, NatureServe, Partners in Flight, Cagan Sekercoglu, Wetlands International, the IUCN/SSC Specialist Groups, particularly the Threatened Waterbird Specialist Group and the galliformes specialist groups coordinated by the World Pheasant Association, and Tim Inskip (UNEP: WCMC).

Reptiles

Institutional support

Institutional support to the Sampled Red List Index for reptiles was provided by grants from the Esmée Fairbairn Foundation and the Rufford Maurice Laing Foundation. The Global Reptile Assessment (GRA) initiative, which assessed some of the species in the SRLI sample, is supported by the Moore Family Foundation, the Gordon and Betty Moore Foundation, Conservation International, the Critical Ecosystem Partnership Fund (CEPF) and the European Commission.

Workshop donors

A generous grant from the Regina Bauer Frankenberg Foundation for Animal Welfare funded assessments of North American (including Mexican) species. Core support to the IUCN Centre for Mediterranean Cooperation enabling the assessment of Mediterranean

species was provided by the Ministry of the Environment and Rural and Marine Affairs, as well as the Junta de Andalusia. Assessment of Philippines species was facilitated by funding from Conservation International (Russell Mittermeier). The European Reptile and Amphibian Assessments were funded through the European Commission (Service Contract No.070307/2007/483288/MAR/B2). Additional support to IUCN that contributed to the success of the workshop was provided by the Critical Ecosystem Partnership Fund (CEPF). Reptiles of New Caledonia were assessed through support received from the governments of Province Nord and Province Sud of New Caledonia.

The assessments of sea snakes and homalopsids, was made possible thanks to financial support from the Fisheries Research and Development Corporation (Crispian Ashby); the Department of Environment, Water, Heritage and Arts (Emma Fletcher, Narelle Montgomery, Loraine Hitch, Donna Kwan); Australian Government Environmental Protection Agency (Col Limpus); and Conservation International (Russell Mittermeier).

Support for assessments of tortoises and freshwater turtles has been provided through the Moore Family Foundation; George Meyer and Maria Semple; Behler Chelonian Center; Centre for Herpetology / Madras Crocodile Bank Trust; Chelonian Research Foundation; Conservation International; Durrell Wildlife Conservation Trust; Frankel Family Foundation; Turtle Conservation Fund; Turtle Survival Alliance; Wildlife Conservation Society; and World Wildlife Fund - Madagascar. The annual meeting of the Iguana Specialist Group held in Dominica provided an opportunity to review the Red List assessments for several species, which was supported by the International Iguana Foundation and the San Diego Zoo's Institute for Conservation Research.

Conservation partners

The assessment workshop for Mexican reptile species was kindly hosted by Ricardo Ayala and the station personnel of the Estación de Biología Chamela, Instituto de Biología, Universidad Nacional Autonoma de Mexico. For assisting in organising the workshop and with initial data compilation we would particularly like to thank Georgina Santos Barrera, Andres Garcia and Antonio Muñoz.

We would like to thank the staff of Conservation International - Philippines for workshop and logistical organization in the Philippines, in particular Ruth Grace Rosell-Ambal, Melizar V. Duya and Oliver Coroza. Conservation International – New Caledonia provided hosted the New Caledonia workshop, and we particularly extend our gratitude to Jérôme Spaggiari and François Martel for their help with logistics, and to Jean-Christophe Lefeauvre for post-workshop assistance.

For the European assessments, we thank our host organisation, Doğa Derneği, and most especially Özge Balkız and Özgür Koç, for their extensive help with logistical arrangements.

Dr Colin Limpus (Australian Government Environmental Protection Agency) and the International Sea Turtle Symposium committee provided logistical and organizational support for the seasnakes and homalopsids workshop. Special thanks to Jenny Chapman

(EPA) and Chloe Schuble (ISTS). Thank you also to Dr Gordon Guymer (Chief Botanist – Director of Herbarium) for accommodating us at the Herbarium in the Brisbane Botanical Gardens, and to Mark Read and Kirsten Dobbs (Great Barrier Reef Marine Parks Association) and Dave Pollard and Brad Warren from OceanWatch Australia for institutional support.

For the workshop on iguanas, we extend a particular word of thanks to the hosts, Dominican Forestry, Wildlife, and Parks Division, specifically Arlington James and Jacqueline Andre, and to Chuck Knapp for organizing the meeting and arranging all logistics.

We would also particularly like to thank the following people who kindly helped facilitate working groups at workshops: Melanie Bilz, Oliver Coroza, Naamal De Silva, Melizar V. Duya, Matthew Foster, Kate Hodges, Michael Jensen, Penny Langhammer, Seema Mundoli, Ana Nieto, Lily Paniagua, Ruth Grace Rosell-Ambal, Jason van de Merwe, and Sarah Wyatt.

Sarah Lewis, Paul Lintott, Gary Powney, Jennifer Sears, Penny Wilson, Sally Wren, Oliver Wearn, and Tara Zamin helped write and compile many of the initial draft accounts for the sampled assessments.

Cartilaginous fishes

Institutional support

We gratefully acknowledge Conservation International for generously supporting the completion of the Shark Specialist Group's Red List Programme through significant financial backing for workshops, operational costs and staff salaries. We thank the Packard Foundation, which provided core support for workshops, and the Save Our Seas Foundation for their generous support of the SSG. The Marine Conservation Biology Institute provided financial support for assessments for deepsea sharks. Particular thanks are due to the UK's Department of Environment and Rural Affairs for funding the SSG's Programme Officer post, and to the US State Department, both of which provided regular financial support throughout the project. The Pew Fellows in Marine Conservation has supported Sarah Fowler's work with the SSG.

Workshop donors

Besides the core funders above, we also gratefully acknowledge the numerous other funders of the SSG's 13 Red List workshops, including: Associação dos Criadores e Exportadores de Peixes Ornamentais do Estado do Amazonas (ACEPOAM); the Bernice Barbour Foundation; Blue Planet Aquarium; Center for Shark Research (Mote Marine Laboratory); Convention on Migratory Species; the Curtis and Edith Munson Foundation; the Deep; Future of Marine Animal Populations (Program of the Census of Marine Life); Institute for Ocean Conservation Science at the University of Miami; IUCN's Centre for Mediterranean Cooperation; the Joint Nature Conservation Committee; Lenfest Ocean Program; Marine and Coastal Management, South Africa; National Marine Aquarium;

National Shark Research Consortium; the New England Aquarium's Marine Conservation Action Fund; Northern Ireland Environment Agency; Oak Foundation; the Ocean Conservancy; the Ocean Foundation; Park Inn Greenmarket Square, Cape Town; Perry Institute for Marine Science; Sea World (Gold Coast); United States National Oceanic and Atmospheric Administration / National Marine Fisheries Service; Universidade do Estado do Amazonas, Brazil; University of Queensland; and Wildlife Conservation Research Unit.

Conservation partners

Thanks are also due to the UN Food and Agriculture Organisation, Leonard Compagno and John McEachran for providing distribution maps. GIS shapefiles of each species' distribution were created by IUCN's Global Marine Species Assessment staff, supported by Tom Haas and the New Hampshire Charitable Foundation, and we are grateful for their support throughout the project.

All Shark SG staff, interns and volunteers are owed a huge debt of thanks for logistical and technical support. We thank Sarah Ashworth, Gemma Couzens, Claudine Gibson, Mandy Haywood, Kendal Harrison, Adel Heenan, Peter Kyne, Catherine McCormack, Helen Meredith, Kim O'Connor, Rachel Kay, Charlotte Walters, Lindsay MacFarlane, and Lincoln Tasker. We are very grateful to Helen Bates for her hard work and assistance at a crucial point in the project.

Bony fishes

Institutional support

Institutional support to the Sampled Red List Index for fishes was provided by the Rufford Maurice Laing Foundation.

Institutional support to the freshwater species assessments that cover fishes included in the SRLI sample was provided by grants from the European Commission, The Netherlands Ministry of Foreign Affairs (DGIS) through Wetland International, and IUCN Water and Nature Initiative (WANI). Support for regional assessments was provided by: South Africa Institute for Aquatic Biodiversity (Southern Africa); Wetlands International (West Africa); Conservation International (Madagascar); and the MAVA Foundation (North Africa).

Institutional support to the marine species assessments that cover fishes included in the SRLI sample was provided by Tom Haas and the New Hampshire Charitable Foundation (with thanks to Roger McManus and David Knight) and by Conservation International's Global Marine Programme (with thanks to Roger McManus, Greg Stone and Sebastian Troeng).

Workshop donors

Support for the SRLI assessment workshops on freshwater and marine fishes was provided by: Global Environment Facility (through the 2010 Biodiversity Indicators Partnership), The North of England Zoological Society (Chester Zoo), The Fishmongers'

Company, Natural Environment Research Council, and the Centre for Population Biology, Imperial College London.

Core support to the IUCN Centre for Mediterranean Cooperation enabling the assessment of Mediterranean freshwater fishes was provided by the Ministry of the Environment and Rural and Marine Affairs, as well as the Junta de Andalusia. The IUCN Netherlands National Committee funded the Central Africa freshwater fishes workshop. The North of England Zoological Society (Chester) part funded the European Fishes assessment and the Sturgeons workshop (Sturgeons also funded by European Commission). All other Africa-focused workshops were funded by the European Commission.

Support for workshops covering marine fishes included in the SRLI sample was provided by: the Esmée Fairburn Foundation; the MAVA Foundation for Nature Conservation (MAVA Stiftung für Naturschutz / Fondation pour la Protection de la Nature); USAID CTSP (United States Aid for International Development, Coral Triangle Support for Partnerships); FPCI (First Philippine Conservation, Inc.); IBAMA (Instituto Brasileiro do Meio Ambiente E Dos Recursos Naturais Renováveis - The Brazilian Institute of Environment and Renewable Natural Resources); ICMBio (Instituto Chico Mendes de Conservação da Biodiversidade – Chico Mendes Institute for Biodiversity Conservation); Conservation International Philippines; Daniel Cohen; Stone Gossard; Conservation International Cinco Hermanos Fund; US State Department; STRI (Smithsonian Tropical Research Institute); Royal Caribbean Cruise Lines Ocean Fund; The University of Hong Kong; and Conservation International Eastern Tropical Pacific Seascapes program.

Conservation partners

The following organisations hosted workshops to assess African freshwater species: Rhodes University, Grahamstown, South Africa; The Nature Conservation Office, Jonkershoek, South Africa; Wetlands International, Dakar, Senegal (with thanks Mr Abdoulaye Ndiaye for assistance); Institute for Scientific and Technological Research (INSTI, CSIR) in Accra, Ghana; IUCN Eastern Africa regional Office, Nairobi; the IUCN Centre for Mediterranean Cooperation, Malaga; and UNEP-WCMC, Cambridge, UK.

The Cairo freshwater workshop was hosted by the Nature Conservation Sector, Egyptian Environmental Affairs Agency (EEAA), with thanks in particular to Dr Moustafa Fouad and Professor Zalat. We also extend thanks to: the IUCN Moroccan National Committee, and in particular Mr. Brahim Haddane, which provided extensive logistical services to the training workshop held in Rabat (Morocco); and the Research Centre for Biodiversity and Genetic Resources of Porto University (CIBIO-UP), and especially Sónia Ferreira, which provided the venue and the logistics for the evaluation workshop in Porto (Portugal). The Cameroon review workshop was hosted by Dr. Randall Brummett of WorldFish (Humid Forest Ecoregional Center), who, together with UICN Bureau de l'Afrique Centrale in Yaoundé, also provided key logistical support.

The European freshwater fishes workshop was hosted by the Leibniz Institute of Freshwater Ecology and Inland Fisheries, Berlin. The Sturgeon workshop was hosted by

the 6th International Symposium on Sturgeon in Wuhan, China.

The workshop on groupers was hosted by the Robert Black College at the University of Hong Kong, where invaluable support was provided by the Department of Ecology & Biodiversity, and by Rachel Wong, Anna Situ, Allen To, and Kevin Rhodes. The first workshop on wrasses (in Brazil) was hosted by IBAMA and ICMBio, with logistical support ably provided by Beatrice Padovani Ferreira and Monica Brick Perez. The second workshop (in the Philippines) was hosted by Silliman University, with logistical support provided by Edna Sabater and Rodolfo Ferdinand Quicho.

We are very grateful to the Smithsonian Tropical Research Institute for helping to host the first Eastern Tropical Pacific Fishes workshop, and to Arturo Dominici for his tremendous help with logistics. The second ETP workshop was hosted by the University of Costa Rica, with logistical support kindly provided by Juan Jose Alvarado and Jorge Cortés.

We would also particularly like to thank the following people who kindly helped facilitate working groups at workshops: Moonyeen Alava, Juan Jose Alvarado, Diego Barneche, Laurel Bennett, Alison Beresford, Jon Bielby, Emma Brooks, Will Crosse, Georgia Cryer, Graham Edgar, Matt Foster, Nieves Garcia, Claudine Gibson, Julie Griffin, Scott Henderson, Kirsty Kemp, Tom Lowe, Beatriz Medina, Arturo Mora, Marco Quesada, Karla Rojas-Jiménez, Mia Comeros-Raynal, Mary Seddon, Sandra Simoes, Jennifer Smith, Oliver Wearn, and Sally Wren.

Blythe Jopling, Sarah Lewis, Paul Lintott, Nicola Lipczynski, Jennifer Sears, Penny Wilson, Sally Wren and Oliver Wearn helped write and compile many of the initial draft accounts for the sampled assessments.

The contribution of Jörg Freyhof has been funded with support from the EC under FP7, Contract 226874 (BioFresh).

Any opinions, findings, and conclusions or recommendations in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation or any other funding sources.

6.3 Contributing scientists

Extraordinary, voluntary commitment from leading experts is the backbone of IUCN's species assessment process. The assessment of the species analysed in the current study are entirely due to extraordinarily generous contributions of the time and expertise of more than 3,000 species experts, many of them members of IUCN/SSC Specialist Groups. It is impossible to overstate the importance of these dedicated individuals—without them the current summary of conservation status for this major class of animals would not have been possible. We have tried to record their information faithfully, and we take full responsibility for errors contained within the assessments. It is our hope that the information will be refined, consolidated and updated over time. We express our

gratitude to the following people, asking for forgiveness from anyone whose name has been inadvertently omitted.

List of people who assessed, reviewed or contributed in some way to the vertebrate non-bird assessments included in this analysis (we apologise for any misspellings, duplicate names, or for any omissions):

Abba, A.M.; Abban, K.; Abdel-Rahman, E.H.; Abe, H.; Abramov, A.; Abril, V.V.; Abu Baker, M.A.; Acero, A.; Acevedo, M.; Acosta, A.; Acosta, G.; Acuña, E.; Acuña Juncá, F.; Adams, M.; Adams, S.; Adams, W.F.; Addoor, S.N.R.; Adolphus, K.; Afuang, L.; Agarwal, I.; Agasyan, A.; Aguero, J.; Aguilar, A.; Aguilar Puntriano, C.; Aguilera, M.; Aguirre, L.; Agwanda, B.; Ahmad, N.; Ahmed, M.F.; Ajtic, R.; Akarsu, F.; Akhtar, N.; Al Dosary, M.; Al Habhani, H.M.; Al Khaldi, A.M.; Al Mutairi, M.S.; Al Nuaimi, A.S.M.; Alava, M.; Albanese, B.; Albornoz, R.; Alcalá, A.; Alcalá, E.; Alcaldé, J.T.; Alempath, M.; Alford, R.; Ali, A.; Alkon, P.U.; Allen, D.; Allen, G.R.; Allison, A.; Almeida, D.; Almeida, Z.; Almendáriz, A.; Altrichter, M.; Alvarado, J.; Alvarez, R.; Álvarez, S.J.; Álvarez-Castañeda, S.T.; Alves, P.C.; Alviola, P.; Amanzo, J.; Amezcuá Torrijos, I.; Amézquita, A.; Amiet, J.-L.; Amir, O.G.; Amori, G.; Amorim, A.F.; Amr, Z.; Anacleto, T.; Anandanarayanan, ; Ananjeva, N.B.; Ancrenaz, M.; Andayani, N.; Andelt, W.; Anderson, C.; Anderson, M.; Anderson, P.K.; Anderson, R.; Anderson, R.P.; Anderson, S.C.; Andrade, G.; Andrainarivo, C.; Andrén, C.; Andreone, F.; Andriafidison, D.; Andriaholinirina, V.N.; Andrianjakarivelo, V.; Angelici, F.M.; Angerbjörn, A.; Angulo, A.; Anstis, M.; Anthony, B.; Anwarul Islam, Md.; Ao, M.; Aplin, K.; Appleton, B.; Aquino, L.; Arauz, R.; Arboleda, I.; Ardila-Robayo, M.C.; Arfelli, C.A.; Ariunbold, J.; Arizabal, W.; Arnaud, G.; Arntzen, J.W.; Arredondo, J.C.; Arroyo, S.; Arroyo-Cabral, J.; Arteaga, M.; Arumugam, R.; Arzabe, C.; Asa, C.S.; Asber, M.; Ashenafi, Z.T.; Asmat, S.M.G.; Assogbadjo, A.; Astua de Moraes, D.; Atkinson, R.P.D.; Aulagnier, S.; Auliya, M.; Aune, K.; Auriolles, D.; Auster, P.; Austin, C.C.; Avci, A.; Avila Villegas, H.; Avila-Pires, T.C.S.; Avirmed, D.; Awaïss, A.; Azeroual, A.; Azevedo-Ramos, C.; Azlan, A.; Azlan, M.J.; Babik, W.; Badi, S.; Baha El Din, S.M.; Baigún, R.; Bailey, M.; Baillie, J.E.M.; Bain, R.H.; Baird, R.; Baker, J.; Baker, K.D.; Baker, L.R.; Balanov, A.A.; Baldi, B.; Baldi, R.; Baldisseri, F.; Baldo, D.; Balestra, A.D.; Balete, D.; Balfour, D.; Ballesteros, F.; Balletto, E.; Balmforth, Z.; Baloyan, S.; Bambaradeniya, C.; Bangoura, M.A.; Banks, P.; Bannister, J.L.; Bantel, C.G.; Baral, H.S.; Baranes, A.; Barashkova, A.; Barbanti, M.; Barbieri, R.; Barbour, C.D.; Bargali, H.; Barker, A.S.; Barlow, J.; Barnett, A.A.; Barnett, L.A.K.; Barney, L.; Barquez, R.; Barrantes, U.; Barratt, P.J.; Barraza, E.; Barrio, C.; Barrio, J.; Barrio-Amorós, C.L.; Barry, R.; Bartels, P.; Bartnik, S.; Barua, M.; Basso, N.G.; Bastos, R.P.; Basu, D.; Batbold, J.; Bates, H.; Bates, M.F.; Bates, P.; Batin, G.; Batistella, A.M.; Batsaikhan, A.; Batsaikhan, N.; Bauer, A.M.; Bauer, H.; Baum, J.K.; Baxter, R.; Bayona, J.D.R.; Beachy, C.; Beamer, D.; Bearder, S.; Béarez, P.; Bearzi, G.; Beauvais, G.P.; Beccaceci, M.D.; Beck, H.; Beckmann, J.; Beebee, T.; Beerli, P.; Beever, E.A.; Begg, C.; Begg, K.; Beier, M.; Beja, P.; Bekoff, M.; Belant, J.; Belbachir, F.; Bell, B.D.; Bello, J.; Benda, P.; Benishay, J.M.; Bennett, D.; Bennett, M.B.; Benshemesh, J.; Bentancur, R.; Berducou, C.; Beresford, A.; Bergallo, H.; Bergl, R.A.; Bergmans, W.; Bergstrom, B.; Berlin, E.; Bermúdez Larrazabal, L.; Bernal, M.; Bernal, N.; Bernal, O.; Berneck, B.; Berridge, R.; Berry, C.; Bertolino, S.; Bertoluci, J.; Bertozzi, M.;

Bessudo, S.; Best, P.B.; Bestelmeyer, S.; Betancur, R.; Bethea, D.M.; Beyer, A.; Bhat, G.K.; Bhatnagar, Y.V.; Bhatta, G.; Bhatta, T.; Bhattacharyya, T.; Bhuddhe, G.; Bhupathy, S.; Bianchi, I.; Bianco, G.; Bickford, D.; Bidau, C.; Biggins, D.; Bigirimana, C.; Biju, S.D.; Bila-Isia, I.; Bills, R.; Biscoito, M.; Bishop, P.; Bist, S.S.; Bisther, M.; Bizzarro, J.J.; Bjørge, A.; Black, P.A.; Blanc, J.; Blasdale, T.; Bleisch, B.; Bleisch, W.; Blois, J.; Blom, A.; Blomquist, S.; Bloomer, P.; Blotto, B.; Boada, C.; Boeadi, ; Boesch, C.; Bogutskaya, N.; Bohm, M.; Böhme, W.; Boisserie, J.-R.; Boistel, R.; Boitani, L.; Bolaños, F.; Bolívar, W.; Bolkovic, M.; Bolten, A.; Bonaccorso, F.; Bonal, B.S.; Bonfil, R.; Bonvicino, C.; Boonratana, R.; Borah, M.M.; Borczyk, B.; Bordoloi, S.C.; Borges-Nojosa, D.M.; Born, E.W.; Born, M.; Borroto, R.; Bosch, J.; Bossuyt, F.; Bosworth, B.; Botello, J.C.; Boublí, J.-P.; Bousso, T.; Bóveda-Penalba, A.J.; Bowler, M.; Boyd, L.; Boyer, A.F.; Boza, E.; Bozdogan, M.; Bozdógan, M.; Bradai, M.N.; Bradford, D.; Bradley Martin, E.; Brahim, K.; Branch, W.R.; Brandão, R.; Brandle, R.; Branstetter, S.; Brash, J.M.; Brasileiro, C.; Braswell, A.; Braulik, G.T.; Breed, W.; Breitenmoser, U.; Breitenmoser-Wursten, C.; Brereton, R.; Brescia, F.; Breuil, M.; Brickle, N.W.; Brito, D.; Broadley, D.G.; Brockelman, W.; Broderick, A.C.; Bronner, G.; Brooke, A.; Brooks, E.; Brooks, S.E.; Broome, L.; Brown, D.; Brown, D.; Brown, J.; Brown, M.; Brown, P.; Brown, R.; Brown, R.M.; Brownell Jr., R.L.; Brugiere, D.; Brummett, R.; Bucal, D.; Buden, D.; Buhlmann, K.; Bukhnikashvili, A.; Bumrungsri, S.; Burbidge, A.; Burdin, A.; Burger, M.; Burgess, G.H.; Burkanov, V.; Burkhardt, T.; Burneo, S.; Burnett, S.; Burton, J.; Bury, B.; Bussing, W.; Bustamante, M.R.; Butterworth, D.S.; Butynski, T.M.; Buuveibaatar, V.; Byers, J.; Cabanban, A.S.; Cadena, A.; Cadle, J.E.; Cailliet, G.M.; Cajas, J.; Cajas, J.O.; Caldas Aristizábal, J.P.; Calderón Mandujano, R.; Camancho, J.; Camara, L.; Cambray, J.; Campagna, C.; Campbell, J.A.; Camperio-Ciani, A.; Cannings, S.; Canseco-Márquez, L.; Canty, P.; Capadan, P.; Captain, A.S.; Capuli, E.; Caramaschi, U.; Carbyn, L.; Cardiff, S.G.; Carey, C.; Carino, P.; Cariño, A.B.; Carlisle, A.B.; Carlson, D.M.; Carlson, J.K.; Carmona, J.; Carnaval, A.C.Q.; Carpenter, A.I.; Carpenter, K.; Carpenter, K.E.; Carranza, S.; Carreira, S.; Carrick, F.; Carrillo, L.; Carrillo, O.; Carvalho-e-Silva, A.M.P.T.; Caso, A.; Casper, B.M.; Cassimiro, J.; Cassinello, J.; Castañeda, F.; Castañeda, R.M.; Castellanos, A.; Castillo, A.; Castillo-Geniz, J.L.; Castro, A.L.F.; Castro, F.; Castro, O.; Castro-Arellano, I.; Castroviejo-Fisher, S.; Catenazzi, A.; Catzeffis, F.; Causado, J.; Cavallini, P.; Cavanagh, R.D.; Ceballos-Mago, N.; Cedeño-Vázquez, J.R.; Cervantes, F.A.; Céspedes, J.A.; Chaiyarat, R.; Chakraborty, S.; Chalise, M.; Chaloupka, M.; Chalukian, S.; Chan, B.; Chan, B.P.L.; Chan-ard, T.; Channing, A.; Chanson, J.S.; Chao, N.L.; Chaparro, J.C.; Chapman, R.; Chapman, R.E.; Chapple, D.G.; Chardonnet, P.; Charvet-Almeida, P.; Chauhan, N.P.S.; Chaves, G.; Chelmala, S.; Chen, X.-Y.; Chenery, A.; Cheung, W.; Cheylan, M.; Chhangani, A.; Chiang, P.J.; Chiaramonte, G.E.; Chiarello, A.; Chilala, A.; Chin, A.; Chiozza, F.; Chippindale, P.; Chitaukali, W.; Choat, J.H.; Chou, W.; Choudhury, A.; Choudhury, B.C.; Christoff, A.; Chuaynkern, Y.; Chundawat, R.S.; Chundaway, R.A.; Church, D.; Cianfrani, C.; Cilliers, S.; Cisneros-Heredia, D.F.; Clapham, P.J.; Clark, T.B.; Clarke, J.; Clarke, M.W.; Clarke, S.C.; Clarke, T.A.; Clausen, M.K.; Cliff, G.; Clò, S.; Coelho, R.; Coetzee, N.; Cogalniceanu, D.; Cogger, H.A.; Cogger, H.G.; Collen, B.; Collette, B.B.; Colli, G.R.; Collins, J.T.; Collins, K.; Collins, T.; Coloma, L.A.; Compagno, L.J.V.; Conover, D.O.; Conrath, C.; Conroy, J.; Constantino, E.; Contreras-MacBeath, T.; Cook, S.F.; Cooke, J.; Cooke, R.; Cooper, N.; Copley, P.; Córdova Santa Gadea, J.H.; Cornejo,

F.; Coroiu, C.; Coroiu, I.; Correia, J.P.S.; Cortes, J.; Cortés, E.; Cortés-Ortiz, L.; Cortez Fernandez, C.F.; Corti, C.; Corti, M.; Corti, P.; Cossios, D.; Cossíos, E.D.; Costa, G.C.; Costa, L.; Costa, P.; Cotayo, L.; Cotterill, F.P.D.; Cotto, A.; Courtenay, O.; Courtney, T.; Couzens, G.; Covert, B.; Cox, D.; Cox, N.A.; Coxe, S.; Craig, C.; Craig, M.; Craul, M.; Crawford-Cabral, J.; Creel, S.; Crespo, E.A.; Crider, D.; Crivelli, A.J.; Crnobrnja Isailovic, J.; Crnobrnja-Isailovic, J.; Crochet, P.-A.; Crombie, R.; Cronin, E.S.; Crother, B.I.; Crozier, P.; Crump, M.; Cruz, C.A.G.; Cruz, F.B.; Cruz, G.; Cruz-Aldan, E.; Csorba, G.; Cuarón, A.D.; Cuéllar, E.; Cumming, D.H.M.; Cunningham, M.; Curtis-Quick, J.; Custodio, C.; Cuzin, F.; Cypher, B.L.; Da Costa, L.; da Fonseca, G.A.B.; da Rocha, P.L.B.; Dagit, D.D.; Dalebout, M.L.; Dalponte, J.; Daniel, B.A.; Daniels, R.; Daniels, R.; Daniels, R.J.R.; Dans, S.; Darria, J.; Darwall, W.; Das, I.; Das, J.; Datta, N.C.; Dávalos, L.; Davenport, T.R.B.; David, J.; David, P.; Davidson, C.; Davis, C.D.; Dawson, S.M.; de A. Goonatilake, W.I.L.D.P.T.S.; de Albuquerque, N.R.; de Almeida, M.P.; de Bustos, S.; de Carvalho, M.R.; de Grammont, P.C.; De Haan, C.C.; de Iongh, H.; De Jong, Y.; De la Riva, I.J.; de la Sancha, N.; de la Torre, S.; De Leon, J.; De Luca, D.; de Oliveira, L.F.; de Oliveira, M.M.; de Oliveira, T.; de Queiroz, K.; de Silva, A.; de Silva, P.K.; de Smet, K.; de Thoisy, B.; de Tores, P.; de Villiers, A.; Decher, J.; Degani, G.; Deka, P.; Delfino, G.; Delgado, C.; D'Elia, G.; Delima, E.M.; DeLuycker, A.M.; Demegillo, A.; Denham, J.; Dening Touokong, C.; Denny, M.; Denoël, M.; Derocher, A.E.; Desai, A.; Deutsch, C.J.; Devi, R.; Devine, J.A.; Dewhurst, N.; Dey, S.C.; Dharmadi, ; d'Huart, J.P.; Di Fiore, A.; Di Giacomo, E.; di Tada, I.E.; Diaz, A.G.; Diaz, M.; Díaz, L.M.; Diaz Paniagua, C.; Díaz-Páez, H.; Dicken, M.; Dickman, C.; Diesmos, A.C.; Diesmos, M.L.; Dieterlen, F.; Dimalibot, J.; Dinh Thong, V.; Diop, M.; Dipper, F.; Dirksen, L.; Dirrigl Jr., F.; Disi, A.M.; Ditchfield, R.; Dittus, W.; Dixon, J.R.; Dixon, R.; Do Tuoc, ; Doan, T.M.; Dobbs, K.; Dodd, K.; Doggart, N.; Dolino, C.; Dollar, L.; Domingo, A.; Dominici-Arosemena, A.; Domning, D.; Donaire-Barroso, D.; Donnelly, M.; Donovan, G.P.; Doody, S.; Dooley, J.; Dorjderem, S.; Doroff, A.; Doughty, P.; Doumbouya, F.; Dowler, R.; Dowling, T.E.; Downer, C.; Drew, C.; Drewes, R.; Driessen, M.; Drioli, M.; Driscoll, C.; Drummond, L.O.; Duarte, A.; Duarte, J.; Duarte, J.M.B.; Dublin, H.T.; Duckworth, J.W.; Ducrocq, M.; Dudley, S.D.; Dudley, S.F.J.; Duellman, W.E.; Duffy, C.A.J.; Dujsebayeva, T.; Dulvy, N.K.; Duncan, J.R.; Dunham, A.; Dunn, A.; Dunnum, J.; Dupain, J.; Duplaix, N.; Durant, P.; Durant, S.; Durate, J.M.B.; Durbin, J.; Durbin, L.S.; Dutta, S.; Dutton, P.; Duvall, C.; Duya, A.; Duya, M.R.; Duya, P.; Eamkamon, T.; Easa, P.S.; Ebert, D.A.; Edgar, G.; Edgar, P.; Edwards, A.; Eeley, H.; Egan, V.T.; Ehardt, C.; Ehardt, T.; Eizirik, E.; Eken, G.; Ekué, M.R.M.; El Mouden, E.H.; Elder, J.F.; Elias, P.; Ellis, C.M.; Ellis, J.E.; Ellis, M.; Ellis, S.; Elmer, K.; Elron, E.; Embert, D.; Emmett, D.; Emmons, L.; Emslie, R.; Endicott, M.R.; Engelbrecht, J.; Entsua-Mensah, M.; Erdmann, M.; Erk'akan, F.; Erzini, K.; Eschmeyer, W.; Espino Castellanos, L.A.; Espinosa-Perez, H.; Espinoza, R.E.; Esselstyn, J.; Estupinan, R.A.; Eterovick, P.C.; Evangelista, E.; Evans, T.; Everett, B.; Fa, J.; Fagundes, L.; Fagundes, V.; Fahmi, ; Fahr, J.; Faivovich, J.; Fallabrino, A.; Faria, V.; Farías, V.; Farmer, K.H.; Fasola, L.; Faulhaber, C.A.; Faulkes, C.; Feh, C.; Feio, R.N.; Feistner, A.; Felix, T.; Fellers, G.; Fellers, G.M.; Fellowes, J.; Feng, Z.; Fennelly, J.; Ferguson, M.; Fergusson, I.K.; Fernandes, M.; Fernández-Badillo, E.; Fernandez-Duque, E.; Fernando, P.; Fernando, S.; Ferrari, S.F.; Ferreira, B.P.; Ferreira, D.C.; Ferretti, F.; Ferreyra, N.; Festa-Bianchet, M.; Findley, L.T.; Finnie, D.; Fishar, M.R.A.; Fisher, D.; Fitzgerald, L.; FitzGibbon, C.; FitzSimmons, N.; Flaherty, A.;

Flammang, B.E.; Flander, M.; Flannery, T.; Fletcher, E.; Floeter, S.; Flores-Villela, O.; Flueck, W.; Foerester, C.; Forbes, T.; Forchhammer, M.; Ford, J.; Fordham, S.; Formas, J.; Formas, R.; Formozov, N.; Forney, K.; Foufopoulos, J.; Foulkes, J.; Fouquet, A.; Fowler, S.L.; Fragoso, J.; França, F.G.R.; Francis, C.; Francis, M.P.; Franco, F.L.; Franco, M.; Fredriksson, G.; Freire, E.M.X.; Freitas, M.; Fretey, T.; Frey, J.; Freyhof, J.; Fricke, R.; Friend, T.; Fritzsche, R.; Frost, A.; Frost, D.R.; Fruth, B.; Fuenmayor, Q.; Fuentes-Ramos, O.; Fuller, T.K.; Funes, M.; Furey, N.; Furtado, M.; Furuchi, T.; Gadig, O.B.F.; Gadsden, H.; Gafny, S.; Gaibor, N.; Gaikhorst, G.; Galat, G.; Galat-Luong, A.; Gales, N.; Gallina, S.; Gallina Tessaro, S.; Gamble, T.; Gankhuyag, P.; Ganzhorn, J.; Garayzar, C.V.; Garbutt, N.; Garcia, H.; Garcia, J.E.; Garcia, J.J.; Garcia, P.C.A.; García, I.; García, J.C.; García Aguayo, A.; García-París, M.; García-Pérez, J.E.; Garcia-Rangel, S.; García-Vasco, D.; Gardner, A.; Garibaldi, A.; Garner, T.; Garshelis, D.L.; Gartshore, M.; Gascon, C.; Gasith, A.; Gaspar, A.L.B.; Gates, C.; Gatti, S.; Gatus, J.; Gaubert, P.; Gaucher, P.; Gaudiano, J.P.; Gaulke, M.; Geberemedhin, B.; Gedamke, T.; Gee, G.; Geffen, E.; Geise, L.; Geissmann, T.; Geist, V.; Gelatt, T.; Gem, E.; Geng, B.; Geniez, P.; Georges, A.; Geraldine, V.; Gerber, L.; Gerlach, J.; Gerson, H.; Gese, E.M.; Getahun, A.; Ghodke, S.; Giachi, F.; Giannatos, G.; Giaretta, A.A.; Gibson, C.; Gilbert, C.; Gilbert, D.; Gill, R.; Gillespie, G.; Gimán, B.; Ginsberg, J.R.; Gippoliti, S.; Giri, V.; Gizejewski, Z.; Glaw, F.; Gledhill, D.; Glowacinski, Z.; Gober, P.; Góes de Araújo, M.L.; Goldberg, S.R.; Golden, C.; Goldman, C.; Goldman, K.J.; Goldstein, I.; Goldsworthy, S.; Gomez, R.; Gómez-Laverde, M.; Gomon, M.F.; Gon, O.; Gondek, A.; Gongora, J.; Gonzales, J.-C.; Gonzalez, E.; Gonzalez, J.C.; Gonzalez, M.; Gonzalez, P.; Gonzalez, T.; González, B.; González, J.; González, S.; Gonzalez-Maya, J.; Goodman, S.M.; Goossens, B.; Gordon, G.; Gordon, I.; Gordon, J.D.M.; Goren, M.; Gorzula, S.; Gottelli, D.; Gour-Broome, V.A.; Gower, D.J.; Grach, C.; Graham, K.J.; Graham, R.T.; Granjon, L.; Grant, T.; Grant, T.; Grassman, L.; Grasso, R.; Greenbaum, E.; Greengrass, E.; Gregorin, A.D.; Griffin, J.; Griffin, M.; Griffiths, M.; Griffiths, R.; Grismer, L.L.; Groenedijk, J.; Grossman, G.; Groves, C.P.; Grubb, P.; Grubbs, R.D.; Gu, H.-Q.; Guallart, J.; Guayasamin, J.M.; Guevara, M.A.; Guinea, M.; Guineo, G.; Gumal, M.; Gunawardena, M.; Gunn, A.; Günther, R.; Guo, P.; Gururaja, K.V.; Gutierrez, B.; Gutiérrez-Cárdenas, P.; Gutiérrez, E.E.; Guzman-Mora, A.G.; Ha, D.S.; Haag, W.R.; Haas, D.L.; Habib, B.; Hack, M.A.; Hadjisterkotis, E.; Haedrich, R.L.; Hafner, D.J.; Hai Yin, W.; Hajkova, P.; Haka, F.; Hall, J.; Hall, L.; Hallermann, J.; Hamilton, S.; Hammer, S.; Hammerson, G.A.; Hammond, P.S.; Hampson, K.; Han, K.H.; Hanken, J.; Hanski, I.; Hanssens, M.; Happold, D.; Happold, M.; Harding, L.; Hardy, J.; Hare, J.; Hare, K.; Hareide, N.R.; Hätkönen, T.; Harold, A.S.; Harrel, S.; Harris, R.B.; Harrison, J.; Harrison, J.; Hart, J.; Hart, T.; Hartel, K.; Harvey, J.; Harvey, M.B.; Hashimoto, C.; Hashimoto, T.; Hastings, P.A.; Hawkins, A.F.A.; Hawkins, C.E.; Haxhiu, I.; Hays, D.; Haywood, M.; Heaney, L.; Hearn, A.; Heatwole, H.; Heckel, J.-O.; Hedges, B.; Hedges, S.; Hedges, S.B.; Heemstra, P.C.; Heenan, A.; Hefner, R.; Heideman, N.; Helgen, K.; Henderson, A.; Henschel, P.; Henttonen, H.; Herbinger, I.; Herdson, D.; Herman, A.; Hernandez, M.; Hernández, D.; Herndon, A.P.; Hero, J.-M.; Herrera, M.I.; Herrero, J.; Herrington, R.; Herrmann, H.-W.; Hersteinsson, P.; Heupel, M.R.; Heyer, R.; Heymann, E.; Hicham, M.; Hicks, C.; Highton, R.; Hill, R.; Hillers, A.; Hilton-Taylor, C.; Hines, H.; Hitchmough, R.; Hobbelink, M.E.; Hoces, D.; Hoeck, H.; Hoffmann, M.; Hofmeyr, G.; Hohmann, G.; Holden, J.; Holdsworth, M.; Holekamp, K.E.; Hollingsworth, B.; Holtzhausen, H.A.;

Hon, J.; Honer, O.; Honess, P.; Hoogmoed, M.S.; Horner, P.; Horodysky, A.Z.; Horsup, A.; Hoskin, C.; Howard, J.G.; Howell, K.; Hozbor, N.; Hrabar, H.; Hraoui-Bloquet, S.; Htun, S.; Huacaz, D.; Huber, D.; Hudy, M.; Hughes, B.; Huibin, Z.; Hulley, P.A.; Human, B.; Humle, T.; Hunt, K.D.; Hunter, C.; Hunter, L.; Hurley, M.; Hussain, S.A.; Hutchins, B.; Hutchinson, M.N.; Hutson, A.M.; Hutterer, R.; Huveneers, C.; Ibalá Zamba, A.; Ibáñez, R.; Ibéné, B.; Icochea M., J.; Ifuta, S.N.B.; Iglesias, S.; Ilambu, O.; Impson, D.; Inchaustegui, S.; Incháustegui, S.; Indrawan, M.; Ineich, I.; Inger, R.F.; Ingle, N.; Insall, D.; Irwin, K.; Isfendiyaroglu, S.; Is-haquou Daouda, H.; Ishchenko, V.; Ishihara, H.; Ishii, N.; Iskandar, D.; Islam, A.; Isnan, W.; Iverson, J.B.; Iwamoto, T.; Izawa, M.; Jaafar, Z.; Jackson, D.; Jackson, D.R.; Jackson, R.; Jacobs, D.; Jacobsen, I.; Jadot, C.; Jaeger, J.; Jakosalem, P.G.; Jaksic, F.M.; James, D.; James, R.; Jansen, M.; Jaramillo, C.; Jaramillo-Legorreta, A.; Jawad, L.A.; Jayat, J.; Jayat, J.P.; Jdeidi, T.; Jefferson, T.A.; Jehle, R.; Jenkins, A.; Jenkins, P.; Jenkins, R.K.B.; Jennings, A.P.; Jennings, R.; Jensen, J.; Jeong, C.H.; Jerusalinsky, L.; Jha, B.R.; Jhala, Y.V.; Jiang, J.; Jiang, Y.-E.; Jiang, Z.; Jiddawi, N.; Jimena San Martín, M.; Jiménez, J.E.; Joger, U.; Joglar, R.; Johnsingh, A.J.T.; Johnson, K.; Johnston, C.H.; Jolón, M.; Jones, A.; Jones, G.; Jones, K.; Jones, L.M.; Jones, M.; Jones, T.; Jopling, B.; Jordan, M.; Jordan, R.A.; Jorgensen, S.; Jose, R.; Joshi, A.; Joshua, J.; Jungfer, K.-H.; Juškaitis, R.; Juste, J.; Kaariye, X.Y.; Kamenya, S.; Kanchanasaka, B.; Kanchanasakha, B.; Kaneko, Y.; Kappeler, P.; Kara, M.H.; Karanth, U.; Karataş, A.; Karatash, A.; Karczmarski, L.; Karns, D.; Karsen, S.; Karunarathna, S.; Kaska, Y.; Kasparek, M.; Kasuya, T.; Kauhala, K.; Kawada, S.; Kawai, T.; Kawanishi, K.; Kaya, U.; Kays, R.; Kazembe, J.; Kebede, F.; Kefelioglu, H.; Keirulff, M.C.M.; Keith, M.; Kelly, B.T.; Kelly, M.; Kelt, D.; Kemp, K.; Kemper, C.; Keogh, S.J.; Kerbis Peterhans, J.; Kerle, A.; Keuroghlian, A.; Khac Quyet, L.; Khalikov, R.; Khan, A.; Khan, J.A.; Khan, M.K.M.; Khan, M.S.; Khan, S.E.; Khat Quyet, L.; Khonsue, W.; Khorozyan, I.; Kierulff, M.C.M.; Kiliç, T.; Kimura, S.; King, S.R.B.; Kingdon, J.; Kingston, T.; Kiss, I.; Kizirian, D.; Klingel, H.; Knapp, L.W.; Knowlton, F.; Kock, D.; Koenig, S.; Kofoky, A.F.; Kohin, S.; Köhler, G.; Köhler, J.; Kok, P.; Kolby, J.E.; Konstant, B.; Koprowski, J.; Kornacker, P.; Kotas, J.E.; Kottelat, M.; Kouadio, A.; Kovacs, K.; Kovács, T.; Kozłowski, A.; Krantz, A.; Kranz, A.; Krasinska, M.; Krasinski, Z.A.; Kraus, F.; Krose, M.; Kryger, U.; Kryštofek, B.; Kubicki, B.; Kuchling, G.; Kuhajda, B.R.; Kukuev, E.; Kulka, D.W.; Kullander, F.F.; Kumar, A.; Kumar, N.S.; Kumar, S.; Kumar Chhangani, A.; Kumlutaş, Y.; Kunte, K.; Kunz, K.; Künzel, T.; Kupfer, A.; Kurniati, H.; Kurt, F.; Kusrini, M.D.; Kuzmin, S.; Kwet, A.; Kwok Ho, S.; Kyek, M.; Kyne, P.M.; La Marca, E.; Lacher, T.; LaClaire, L.; Lahiri Choudhury, D.K.; Laidre, K.; Lajmanovich, R.; Laker, J.; Lakim, M.; Lalèyè, P.; Lamar, W.W.; Lamarque, F.; Lamilla, J.M.; Lammertink, M.; Lamónaca, A.F.; Lamoreux, J.; Landaeta, M.F.; Lane, A.; Lang, N.; Langguth, A.; Langone, J.; Lanza, B.; Lara, P.; Lara-Ruiz, P.; Lardner, B.; Largen, M.J.; Larson, H.K.; Last, P.R.; Lastica, E.; Latta, G.; Lau, M.W.N.; Laurenson, M.K.; Lavilla, E.O.; Lavin, P.; Lavrenchenko, L.; Lawes, M.J.; Lawson, D.; Lazell, J.; Lea, R.N.; Leandro, L.; Leary, T.; Leasor, H.; LeBreton, M.; Lecis, R.; Ledesma, M.; Lee, B.; Lee, J.; Lehmann, T.; Lehn, C.; Lehr, E.; Leite, M.R.P.; Leite, Y.; Leite-Pitman, R.; Lemckert, F.; Lemine Ould Sidi, M.; Lenain, D.M.; Leong, T.M.; Lescure, J.; Leslie, D.; Lessa, E.; Lessa, R.; Leus, K.; Lew, D.; Lewis, D.; Lewis, S.; Lewison, R.; Lhagvasuren, B.; Li, C.; Li, P.; Li, S.Y.; Liang, F.; Liang, G.; Libois, R.; Licandeo, R.R.; Lichtenstein, G.; Lidicker Jr., W.Z.; Lim, B.; Lima, A.F.B.; Lima, A.P.;

Lima, F.; Lima, R.; Limpus, C.; Limpus, D.; Lindeman, K.C.; Linder, J.; Lindquist, E.; Lindsey, P.; Link, A.; Linkem, C.; Lintott, P.; Linzey, A.V.; Lippold, L.; Lips, K.; Lira-Torres, I.; Lisney, T.J.; List, R.; Lister, A.; Littlejohn, M.; Litvaitis, J.; Litvinov, F.; Livingstone, S.R.; Lizana Avia, M.; Lizcano, D.J.; Lkhagvasuren, D.; Lloyd, P.; Loader, S.; Lobo, A.; Loiselle, P.; Loman, J.; Long, B.; Lopez Arevalo, H.; Lopez Gonzalez, C.; Lopez León, N.P.; Lopez-Gonzalez, C.; Lopez-Luna, M.A.; Lorenzen, E.; Lorenzo, C.; Lorica, R.P.; Lötters, S.; Loucks, C.; Loughry, J.; Louis Jr., E.; Lovari, S.; Love, M.; Loveridge, A.J.; Low, B.; Lowrey, C.; Lowry, L.; Loy, A.; Lu, S.; Lu, W.; Lü, Z.; Lucherini, M.; Lúcia Góes de Araújo, M.; Lue, K.; Luer, C.; Luiselli, L.; Lukey, J.R.; Lukoschek, V.; Lumsden, L.; Luna-Mora, V.F.; Lundberg, M.; Lunde, D.; Lunn, N.; Lunney, D.; Lyenga, A.; Lymberakis, P.; Lynam, A.J.; Lynam, T.; Lynch, J.D.; Maas, B.; Mabee, T.; MacCulloch, R.D.; Macdonald, A.A.; Macdonald, D.W.; Macey, J.R.; Macias, D.; Maciel, N.; MacKenzie, K.; MacKinnon, J.; MacPhee, R.; Maeda, K.; Maffei, L.; Magin, C.; Magnusson, W.; Maharadatunamsi, D.; Maharadatunkamsi, D.; Maharandatunkamsi, D.; Maheswaran, G.; Mahony, M.; Mailosi, A.; Maisels, F.; Makocho, P.; Malakar, M.C.; Malcolm, J.R.; Maldonado-Silva, R.A.; Mallari, A.; Mallon, D.P.; Malonza, P.; Mamonekene, V.; Manamendra-Arachchi, K.; Mancina, C.A.; Mancini, P.; Mancusi, C.M.; Maneyro, R.; Manh Ha, N.; Manjaji, B.M.; Mann, T.; Mannullang, B.; Manthey, U.; Mantilla, H.; Manullang, B.; Manzanilla, J.; Maran, T.; Maree, S.; Mariaux, J.; Marinho, F.; Marinho-Filho, J.; Marino, J.; Maritz, B.; Marker, L.; Marks, M.; Marmontel, M.; Marques, O.; Marquez, R.; Márquez, F.; Márquez, R.; Márquez-Farias, J.F.; Marsh, D.; Marsh, H.; Marsh, L.; Marsh, L.K.; Marsh, P.C.; Marshall, A.; Marshall, A.D.; Marshall, B.; Marshall, L.J.; Martin, R.; Martinez, J.; Martinez Ruiz, J.L.; Martinez-Ortiz, J.; Martínez-Solano, I.; Martíková, N.; Martins, M.; Martins, P.; Marty, C.; Martyr, D.; Maryan, B.; Maryanto, I.; Maslova, I.; Masoud, T.S.; Massa, A.; Massetti, M.; Master, L.; Masterson, G.; Mateo Miras, J.A.; Mathew, R.; Mathews, N.; Matillano, J.; Matola, S.; Matson, J.; Matsui, M.; Matsuura, K.; Matthee, C.A.; Mattoccia, M.; Maude, G.; Mawson, P.; Maxwell, A.; May, S.; Mayer, G.C.; Mayer, W.; Mayol Serra, J.; Mazibuko, L.; Mazzoleni, R.; Mbe Tawe, A.N.; McAuley, R.B.; McCallum, H.; McCarthy, T.; McCord, M.E.; McCormack, C.; McCosker, J.E.; McCracken, S.F.; McCranie, J.R.; McCranie, R.; McCreery, K.; McDonald, K.; McDonald, R.; McDonough, C.; McEachran, J.D.; McGraw, S.; McKay, J.; McKenzie, G.; McKenzie, N.; McKnight, M.W.; McLellan, B.N.; McLeod, D.; McNutt, J.W.; McShea, B.; McShea, W.; Mead, J.G.; Means, B.; Measey, G.J.; Measey, J.; Mech, L.D.; Medellín, R.; Medhi, R.; Medici, P.; Medina, A.; Medina, B.; Medina, C.; Medina, E.; Medina, G.; Medina-Vogel, G.; Medri, I.; Meegaskumbura, M.; Meegaskumbura, S.; Megalofonou, P.; Meijaard, E.; Meinig, H.; Meirte, D.; Mejia-Falla, P.A.; Melisch, R.; Mellado, V.P.; Menard, N.; Mendelson, J.R.; Mendes, S.L.; Mendoza-Quijano, F.; Menegon, M.; Menhorst, P.; Menni, R.; Menon, V.; Menzies, J.; Menzies, J.; Merino, M.L.; Merino-Viteri, A.; Meritt, D.; Meritt, M.; Merker, S.; Merlen, G.; Merrett, N.; Mertzanidou, D.; Métrailler, S.; Meyer, A.; Meyer, E.; Meyers, D.; Meyers, R.; Miaud, C.; Mickleburgh, S.; Mignucci-Giannoni, A.; Mijares-Urrutia, A.; Mildenstein, T.; Miller, B.; Miller, D.J.; Mills, M.G.L.; Milne, D.; Milner-Gulland, E.J.; Milton, D.; Min, L.; Min Mi-Sook, ; Mincarone, M.M.; Minter, L.; Miquelle, D.; Mira, A.; Miranda, F.; Miranda Leiva, A.; Miras, J.A.M.; Mire, J.B.; Mitani, J.C.; Mitchell, J.; Mitra, S.; Mitsain, G.; Mittermeier, R.A.; Mix, H.; Moehlman, P.D.; Moehrenschlager, A.;

Moelants, T.; Mohammed, O.B.; Moler, P.; Molina, H.; Molinari, J.; Molinari., J.; Møller, P.R.; Molur, S.; Monadjem, A.; Monkholzul, Ts.; Monsembula, R.; Montenegro, O.L.; Monzini Taccone di Sitizano, J.; Mooney, N.; Moore, A.B.M.; Moore, J.; Moore, J.A.; Moore, L.; Moores, N.; Moraes Tomas, W.; Morales, A.; Morales, A.L.; Morales, M.R.; Morales-Jiménez, A.L.; Morales-Mite, M.; Morato, S.A.A.; Moravec, J.; Morefield, J.; Moreira, G.; Morey, G.; Morey, S.; Morgan, A.; Morgan, B.; Morgan, B.J.; Morgan, D.B.; Morgan, M.; Morgan, S.K.; Morris, K.; Morrison, C.; Morrison, M.; Mortimer, J.A.; Moseby, K.E.; Mosig Reidl, P.; Moss, K.; Mostafa Feeroz, M.; Motokawa, M.; Motomura, H.; Mott, T.; Mouna, M.; Mouni, A.; Moura, R.T.; Moura, T.; Moyer, D.; Moyer, D.C.; Mrakovicic, M.; Msuya, C.; Muddappa, D.; Mueller, H.; Mueses-Cisneros, J.J.; Mukherjee, S.; Mukhina-Kreuzberg, E.; Mulawwa, M.; Mumpuni, ; Munis, M.; Munks, S.; Munny, P.; Muñoz, A.; Muñoz, L.J.P.; Muñoz Alonso, A.; Munroe, T.A.; Murdoch, J.; Murdy, E.; Murphy, J.; Murray, D.; Musick, J.A.; Musser, G.; Mustari, A.H.; Muths, E.; Mycock, S.G.; Myers, R.A.; Nabhitabhata, J.; Nader, I.; Nadler, T.; Nagorsen, D.W.; Nagy, Z.; Nakabo, T.; Nakamura, M.; Nakaya, K.; Nameer, P.O.; Namora, R.C.; Napoli, M.; Naranjo, E.; Narayan, G.; Narvaez, P.; Nascimento, L.B.; Navarro, S.S.; Naveda, A.; Navia, A.F.; Nazarkin, M.; Ndodet, B.; Ndunda, M.; Neckel Oliveira, S.; Neely, D.; Neer, J.A.; Neira-Herrera, D.R.; Nekaris, A.; Nel, J.A.J.; Nel, R.; Nelson, J.; Nettmann, H.K.; Newby, J.; Newell, D.; Newton, P.; Ng, H.H.; Ng, W.C.; Ngoc Thanh, V.; Nguyen Quang Truong, ; Nielsen, J.G.; Nijman, V.; Nilson, G.; Nistri, A.; Nixon, S.; Noblet, J.F.; Nogales S., F.; Nogueira, C.; Norman, B.; Noronha, M.N.; Norris, S.J.; Noss, A.; Notarbartolo di Sciara, G.M.; Nouira, M.S.; Novarino, W.; Novaro, A.J.; Novellie, P.; Nowell, K.; Ntakimazi, G.; Núñez, H.; Núñez, J.; Nusalawo, M.; Nussbaum, R.A.; Nyambayar, B.; Nyberg, D.; Nyhus, P.; Nyström, P.; Nzeyimana, L.; O'Corry-Crowe, G.; Oakwood, M.; Oates, J.F.; Obradovitch, M.; Ochoa, J.; Odhiambo, E.A.; O'Donnell, C.; O'Donovan, D.; Oettinger, M.I.; Ogielska, M.; Ogrodowczyk, A.; Oguge, N.; Ohdachi, S.D.; Ohler, A.; Ojeda, R.; Olaosebikan, B.D.; Olech, W.; Olgun, K.; Oliver, W.; Olivieri, G.; Olson, A.; Olson, L.; Olsson, A.; Omasombo, V.; Ong, P.; Oommen, O.V.; Opoye Itoua, O.; Ordoñez Delgado, L.; Orlov, A.M.; Orlov, N.L.; Ormond, C.G.A.; Ortiz, J.C.; Osorno, M.; Ota, H.; Otgonbaatar, M.; Ovaska, K.; Ovsyanikov, N.; Öz, M.; Pacheco, V.; Packer, C.; Padhye, A.; Padial, J.; Page, L.; Paglia, A.; Paguntalan, L.M.; Paguntulan, L.M.; Painter, C.; Paisley, S.; Palacios, E.; Palden, J.; Palis, J.; Palmeirim, J.; Palomares, F.; Palomo, L.J.; Pamaong, R.; Pamaong-Jose, R.; Pangulatan, L.M.; Papenfuss, T.J.; Pardinas, U.; Pardinus, U.; Parker, F.; Parnaby, H.; Parr, M.; Parra-Olea, G.; Parris, M.; Pasolini, P.; Passamani, M.; Patel, E.; Pattanavibool, A.; Patterson, B.; Patton, J.L.; Patzner, R.A.; Paugy, D.; Paul, L.J.; Paul, S.; Paulin, C.; Paunović, M.; Pauwels, O.S.G.; Pavan, D.; Paxton, J.R.; Payan, E.; Payne, J.; Pearl, C.; Pearson, D.; Pedraza, S.; Pedregosa, M.; Pedregosa, S.; Peeters, P.; Pei, K.J.-C.; Peirce, S.; Peixoto, O.L.; Pek Khiok, A.L.; Peloso, P.; Pennay, M.; Penrose, H.; Peralta, J.; Percequillo, A.R.; Percequillo, M.; Pereira, J.; Perez, M.; Pérez, J.M.; Pérez, S.; Perez Zubieta, J.; Pérez-Jiménez, J.C.; Pérez-Mellado, V.; Pergams, O.; Perieras, A.; Perkin, A.; Perret, J.-L.; Perrin, M.; Perrin, W.F.; Perzanowski, K.; Peters, S.; Pethiyagoda, R.; Pheeha, S.; Phillips, C.; Phillips, D.M.; Phillips, M.K.; Pianka, E.R.; Pickersgill, M.; Pierce, S.J.; Piercy, A.N.; Pilgrim, J.; Pillans, R.; Piller, K.R.; Pimenta, B.; Pimley, E.; Pineda, J.; Pineda, W.; Piñeda, C.; Pinho, M.R.R.; Pino, J.L.; Pinto, L.P.; Pinto de Almeida, M.; Piovezan, U.; Pires Costa, A.; Pires-Costa, L.; Pita, R.; Pitman,

R.L.; Platt, S.G.; Pleguezuelos, J.; Plowman, A.; Plumptre, A.J.; Podloucky, R.; Pogonoski, J.; Polechla, P.; Polidoro, B.A.; Pollard, D.A.; Pollock, C.M.; Pombal Jr., J.P.; Pompert, J.; Ponce-Campos, P.; Popper, K.P.; Porini, G.; Poss, S.G.; Potsch de Carvalho e Silva, S.; Pounds, A.; Pouomogne, V.; Powell, J.; Powell, J.A.; Powell, R.; Poyarkov, A.; Poynton, J.; Pradhan, M.S.; Prasad Pokheral, C.; Pratchett, M.; Price, D.; Priede, I.G.; Princee, F.; Printes, R.C.; Pritchard, P.C.H.; Priyono, A.; Pucek, Z.; Pudyatmoko, S.; Puig, S.; Puky, M.; Purchase, N.; Puschendorf, R.; Pyle, R.; Qarqas, M.; Quaranta, K.L.; Queirolo, D.; Queiroz, H.L.; Querouil, S.; Quevedo Gil, A.; Quijano, S.M.; Quintero Díaz, G.E.; Qureshi, Q.; Rabarivola, J.C.; Rabearivelo, A.; Rabibisoa, N.H.C.; Rabie, A.; Racey, P.A.; Rachlow, J.; Rada, M.; Radder, R.S.; Raffaelli, J.; Raherisehena, M.; Rahmani, A.R.; Rainho, A.; Rajamani, N.; Rakotoarivelo, A.R.; Rakotondravony, D.; Rakotosamimanana, B.; Ram, M.; Ramala, S.P.; Ramayla, S.; Ramiarinjanahary, H.; Ramilo, E.; Ramírez P., M.P.; Randall, D.; Randi, E.; Randriamanantsoa, H.M.; Randriananjafy, V.; Rangel Cordero, H.; Ranivo, J.; Rao, D.-Q.; Rasamimanana, H.; Rasmussen, A.; Rasmussen, G.; Rastegar-Pouyani, N.; Rathbun, G.B.; Ratnayeke, S.; Ratsimomanarivo, F.H.; Ratsimbazafy, J.; Raveloarinoro, G.; Ravichandran, M.S.; Ravino, J.; Rawson, B.; Raxworthy, C.J.; Ray, J.; Ray, P.; Rayaleh, H.A.; Razafimahatratra, E.; Razafimanahaka, H.J.; Razafimanantsoa, A.; Read, J.; Read, M.; Reading, C.J.; Reading, R.; Reardon, M.B.; Reardon, T.; Recuero Gil, E.; Reed, J.; Reeves, R.R.; Reichel, J.D.; Reichle, S.; Reid, F.; Reid, G.M.; Reid, R.; Reid, S.B.; Reilly, S.B.; Reinartz, G.; Reis, M.; Reis, R.; Reizl, J.C.; Renjifo, J.M.; Retallick, R.; Rey, J.; Reyna, R.; Reyna-Hurtado, R.; Reynolds, J.C.; Reynolds, R.P.; Reynolds, V.; Reynolds III, J.E.; Rhind, S.; Rhodes, K.; Rhodin, A.G.J.; Rice, C.; Richard-Hansen, C.; Richards, G.; Richards, J.; Richards, N.; Richards, S.; Richardson, M.; Richter, S.; Rico, E.; Riddle, H.; Riga, F.; Rigaux, P.; Rincon, G.; Rios-López, N.; Ritchie, E.; Rivalta, V.; Rivas, B.; Rivas, G.; Rivas, P.; Rivas-Pava, P.; Rivera, F.; Riveros, J.C.; Robbins, M.; Robbins, R.; Roberton, S.; Roberts, C.; Roberts, D.; Robertson, P.; Robertson, R.; Robertson, R.D.; Robichaud, W.G.; Robinson, A.T.; Robinson, E.; Robinson, H.J.; Robinson, L.; Robinson, T.; Rocha, C.F.D.; Rocha, L.; Rodden, M.; Rödel, M.-O.; Rodrigues, F.; Rodrigues, M.T.; Rodriguez, A.; Rodriguez, B.; Rodríguez, A.; Rodríguez, L.; Rodriguez-Luna, E.; Rodríguez-Luna, E.; Roemer, G.W.; Rogel, T.; Roig, V.G.; Rojas, P.A.; Rojas, R.; Rojas C, A.; Rojas-Bracho, L.; Romano, A.; Romero, M.; Romero Malpica, F.J.; Ron, S.; Rookmaaker, K.; Roos, A.; Roos, C.; Rorabaugh, J.; Rosa, R.S.; Rosell-Ambal, G.; Rosmarino, N.; Ross, J.; Ross, S.; Rossi, R.V.; Rossiter, S.; Roth, E.; Roth, L.; Rovero, F.; Rovito, S.; Roy, D.; Ruanco, G.; Rübel, A.; Rubenstein, D.I.; Rueda-Almonacid, J.V.; Ruedas, L.; Ruiz, C.; Ruiz-Olmo, J.; Rumiz, D.I.; Rumpler, Y.; Runcie, M.; Russell, A.; Russell, B.; Ryan, M.; Ryan, T.; Rylands, A.B.; Sadek, R.A.; Sadlier, R.A.; Sadovy, Y.J.; Saeki, M.; Sagar Baral, H.; Saha, S.S.; Salas, A.W.; Salas, E.; Salas, L.; Salim, A.; Saltz, D.; Salvador, A.; Samba Kumar, N.; Sami Amr, Z.; Samiengo, B.; Samiya, R.; Samoilys, M.; Sampaio, E.; Samudio, R.; San Martín, M.J.; Sanchez, R.; Sánchez, J.; Sanchez Rojas, G.; Sanders, K.; Sanderson, J.; Sano, A.; Santana, F.M.; Santiago, S.; Santos, S.S.D.; Santos Motta, F.; Santos-Barrera, G.; Sanyal, P.; Sarkar, S.K.; Sarker, M.S.U.; Sarker, S.U.; Sarmudio, R.; Sasaki, H.; Sasaki, K.; Sá-Sousa, P.; Sato, K.; Savage, A.; Savage, J.; Sbordoni, V.; Schaaf-DaSilva, J.A.; Schabetsberger, R.; Schaller, G.B.; Schembri, T.; Scherlis, J.; Schettino, L.R.; Scheuerling, E.; Schiøtz, A.; Schipper, J.; Schleich, H.H.; Schliebe, S.; Schlitter, D.;

Schmidt, B.; Schmitz, A.; Schooley, J.D.; Schreiber, A.; Schulte, R.; Schulz, M.; Schwaner, T.; Schwitzer, C.; Schwitzer, N.; Scott, D.; Scott, E.; Scott, M.D.; Scott, N.; Scott Jr., N.J.; Sears, J.; Sebastian, T.; Secada, L.; Secchi, E.R.; Sectionov, ; Sedlock, J.; Sefass, T.; Segalla, M.V.; Seisay, M.; Seitz, V.; Self-Sullivan, C.; Semesi, S.; Semiadi, G.; Señaris, C.; Sengupta, S.; Sepulveda, M.; Sequin, E.; Serena, F.; Serena, M.; Séret, B.; Seri, L.; Servheen, C.; Sevinç, M.; Seydack, A.; Shaefer, J.; Shaffer, B.; Shafiei Bafti, S.; Shah, N.; Shank, C.; Shanker, K.; Shar, S.; Sharif Khan, M.; Sharifi, M.; Shea, G.M.; Shedden, A.; Sheftel, B.; Sheiko, B.; Shekelle, M.; Shenbrot, G.; Shepard, D.; Shepherd, T.; Sheppard, C.; Sherrill-Mix, S.A.; Shi, H.; Shine, R.A.; Shoemaker, A.; Shoshani, H.; Shreshtha, T.K.; Shrestha, N.; Shrestha, T.K.; Shute, P.W.; Sidi, N.; Siegel, R.; Siex, K.; Siler, C.; Sillero-Zubiri, C.; Silva, C.; Silva, G.; Silva Jr., J.S.; Silvano, D.; Silveira, L.; Simkins, G.; Simpfendorfer, C.A.; Sinaga, J.; Sinaga, U.; Sindaco, R.; Singadan, R.; Singh, M.; Singleton, I.; Sinha, A.; Sinisterra Santana, J.; Sinsch, U.; Siu, S.; Skuk, G.; Slimani, T.; Sliwa, A.; Slooten, E.; Smale, M.J.; Smit, H.; Smith, A.; Smith, A.T.; Smith, B.D.; Smith, D.; Smith, E.N.; Smith, J.A.; Smith, K.; Smith, R.; Smith, S.E.; Smith, W.D.; Smith-Vaniz, W.F.; Snelson Jr., F.F.; Snoeks, J.; Soberón, R.R.; Sogbohossou, E.; Solari, S.; Soldo, A.; Soliano, P.; Solís, F.; Somaweera, R.; Song, J.-Y.; Song, Y.-L.; Sorensen, M.; Soriano, P.; Soriano-Velásquez, S.; Sosa-Nishizaki, O.; Soto, J.M.R.; Sousa, M.C.; Southwell, C.; Sovada, M.; Soy, J.; Sozen, M.; Sparks, J.S.; Sparreboom, M.; Spawls, S.; Spironello, W.R.; Spitzenberger, F.; Sredl, M.; Srinivasulu, C.; St. Louis, A.; Stafford, P.J.; Stahnke, L.F.; Starnes, W.C.; Start, T.; Steel, L.; Stehmann, M.F.W.; Stehmann, S.; Stein, D.L.; Steinmetz, R.; Stenberg, C.; Stephenson, P.J.; Sterijovski, B.; Stevens, J.D.; Stevens, K.; Stevenson, D.; Stevenson, P.; Stewart, A.; Stiassny, M.L.J.; Stier, S.; Stöck, M.; Stokes, E.J.; Strahan, R.; Strauss, M.; Streicher, U.; Struhsaker, T.; Stuart, B.L.; Stuart, C.; Stuart, S.N.; Stuart, T.; Stubbe, M.; Stübbe, M.; Stuebing, R.B.; Suárez Mejía, J.A.; Subbotin, A.; Subirá, R.; Sugardjito, J.; Sugimura, K.; Sukhchuluun, G.; Sukumaran, J.; Sulikowski, J.A.; Sumardja, E.; Sunarto, S.; Sunderland-Groves, J.; Sundström, L.F.; Sunyer, J.; Superina, M.; Supriatna, J.; Suyanto, A.; Suyanto, I.; Swan, G.; Swan, M.; Swan, S.; Swarner, M.; Swartz, E.; Sweet, S.S.; Sy, E.; Tabao, M.; Tabaranza, B.; Taber, A.; Tabet, M.A.; Taggart, D.; Tahar, S.; Tallents, L.; Talukdar, B.K.; Talukdar, B.N.; Tampos, G.; Tan, H.H.; Tanaka, S.; Tandy, M.; Tannerfeldt, M.; Targarona, R.R.; Tarkhnishvili, D.; Tatayah, V.; Tavares, V.; Taylor, A.; Taylor, B.L.; Taylor, P.J.; Teclai, R.; Tejedo, M.; Tejedor, A.; Telfer, W.; Temple, H.J.; Teta, P.; Thalmann, U.; Than Zaw, ; Thanh Hai, D.; Thapa, J.; Thirakhupt, K.; Thomas, R.; Thompson, D.; Thompson, J.; Thomson, B.; Thorbjarnarson, J.; Thouless, C.; Thun, S.; Tighe, K.; Tikhonov, A.; Tilson, R.; Timm, B.; Timm, R.; Timm, T.; Timmins, R.J.; Timmins, T.; Ting, N.; Ting, T.; Tinnin, D.; Tinsley, R.; Tinti, F.; Tirira, D.; Tizard, R.J.; Tocher, M.; Tognelli, M.F.; Tok, V.; Tokida, K.; Tokita, K.; Toledo, L.F.; Tolley, K.; Tolson, P.J.; Tooze, Z.J.; Toral, E.; Tornabene, L.; Torres, D.A.; Touk, D.; Tous, P.; Townsend, J.; Traeholt, C.; Tran Quang Phuong, ; Trejo, T.; Treloar, M.A.; Trillmich, F.; Trinnie, F.I.; Trocchi, V.; Tsogbadrakh, M.; Tsytsulina, K.; Tucker, T.; Tuniyev, B.; Tuniyev, S.; Turner, A.A.; Turvey, S.; Tutin, C.E.G.; Tweddle, D.; Twongo, T.K.; Tyler, J.C.; Tyson, M.; Ubaldo, D.; Úbeda, C.A.; Ugurtas, I.H.; Ungaro, N.; Urbán, J.; Urbani, B.; Usukhjargal, D.; Üzüm, C.; Üzüm, N.; Uzzell, T.; Vacchi, M.; Valderrama, C.; Valdespino, C.; Valdez, R.; Valdujo, P.H.; Valente, M.C.M.; Valenti, S.V.; Valenzuela-Galván, D.; Valesco, M.; Valezco, P.; Vallan, D.; van der Elst, R.; van der Heiden, A.M.;

van der Straeten, E.; van Dijk, P.P.; van Gruissen, J.; van Jaarsveld, A.; van Lavieren, E.; van Manen, F.; Van Nhuan, N.; Van Rompaey, H.; Van Rompaey, J.; van Schaik, C.; Van Sluys, M.; van Strien, N.J.; Van Tassell, J.; van Weenen, J.; Vanitharani, J.; Vanni, S.; Varela, D.; Vargas, J.; Vaslin, M.; Vásquez, C.; Vasudevan, K.; Vázquez, E.; Vázquez Díaz, J.; Vázquez-Domínguez, E.; Veiga, L.M.; Velasco, A.; Velazco, P.; Velez-Liendo, X.; Velilla, M.; Veloso, A.; Vences, M.; Venegas, P.; Venkataraman, A.; Verdade, V.; Vermeer, J.; Veron, G.; Veselý, M.; Victor, B.; Vidthayanon, C.; Vidthayanon, D.A.; Vié, J.-C.; Vieira, E.; Vieites, D.; Vijayakumar, S.P.; Vila, A.; Villalba, L.; Villavicencio Garayzar, C.; Vinke, S.; Vinke, T.; Vivar, E.; Vizcaíno, S.; Vogel, G.; Vogel, P.; Vogliotti, A.; Vogrin, M.; Vogt, R.C.; Vohralík, V.; Vololomboahangy, R.; von Arx, M.; Vonesh, J.; Vooren, C.M.; Voris, H.; Vörös, J.; Vyas, R.V.; Wacher, T.; Wade, P.; Wagner, A.; Wahl, R.; Wake, D.; Wake, M.; Waldemarin, H.F.; Waldez, F.; Waldman, B.; Walker, P.; Walker, T.I.; Wallace, R.B.; Wallach, V.; Wallace, R.; Wallays, H.; Walsh, J.H.; Walsh, P.D.; Walsh, S.J.; Walston, J.; Wang, D.; Wang, J.Y.; Wang, S.; Wang, W.; Wang, X.; Wang, X.; Wang, Y.; Wang, Y.; Wang, Y.; Wang Ying, ; Wang Yu, ; Ward, D.; Warguez, D.; Warren, M.L.; Watanabe, K.; Waters, S.; Watling, D.; Watson, A.; Watson, M.; Watson, W.; Wayne, A.; Wayne, R.K.; Webb, R.; Weber, M.; Weinberg, P.; Weksler, M.; Weller, R.; Wells, R.S.; Welsh, H.; Werner, Y.L.; Westerström, A.; Wheeler, J.; Whitaker, A.H.; Whitaker Jr., J.O.; White, M.-D.; White, W.T.; Whitfield, A.; Whiting, M.J.; Whittaker, D.; Whittaker, J.C.; Wich, S.A.; Wickramasinghe, D.; Widmann, P.; Wiesel, I.; Wiig, Ø.; Wijeyamohan, S.; Wikramanayake, E.; Wild, E.R.; Wiles, G.; Wilhelmi, F.; Wilkinson, J.; Wilkinson, M.; Williams, D.F.; Williams, J.T.; Williams, R.; Williams, R.S.R.; Williams, S.; Williams, S.; Williamson, E.A.; Williamson, L.; Willson, K.; Wilmé, L.; Wilson, B.; Wilson, B.; Wilson, L.D.; Wilson, M.L.; Wilson, P.; Wilting, A.; Windfield Pérez, J.C.; Winter, J.; Winterbottom, R.; Wintner, S.P.; Wogan, G.; Woinarski, J.; Wong, G.; Wong, S.; Wood, P.; Woodman, N.; Woodroffe, R.; Woods, C.; Woolley, P.; Wootton, R.J.; Wozencraft, C.; Wright, D.; Wright, P.; Wu, G.; Xia, W.; Xiao, W.; Xie, F.; Xuan Canh, L.; Xuelong, J.; Yaakob, N.S.; Yahya, S.; Yamada, F.; Yambun, P.I.; Yáñez-Muñoz, M.; Yang, B.; Yang, D.; Yang, S.Y.; Yano, K.; Yapa, W.; Ye, C.; Yeeting, B.; Yeniyurt, C.; Yensen, E.; Yigit, N.; Ying-Xiang, W.; Yohannes, H.; Yokohata, Y.; Yom-Tov, Y.; Yongcheng, L.; Yongzu, Z.; Yonzon, P.; Young, B.E.; Young, J.; Yoxon, P.; Yuan Zhigang, Z.; Yustian, I.; Zagarondnyuk, I.; Zagorodniuk, I.; Zagorodnyuk, I.; Zahler, P.; Zaiss, R.; Zambrano, L.; Zapata, F.; Zaw, T.; Zeballos, H.; Zemanova, B.; Zerbini, A.N.; Zhao, E.; Zhao, W.; Zheng, Z.; Zhou, K.; Zhou, K.Y.; Ziegler, T.; Zima, J.; Zimmermann, W.; Zortea, M.; Zorzi, G.; Zuercher, G.L.; Zug, G.R. and Zweifel, R.

BirdLife acknowledges the following persons for providing data, information and review:

Saeed Abdulla Al Khuzai, I Abdusalyamov, Yilma Abebe (University of Washington), E. Abreu, I. Accordi, C Acevedo, Raju Acharya, James Acworth, Pierre-Andre Adam (Ministry of Environment (Seychelles)), Phillista Adhiambo (National Museums of Kenya), W. J. Adsett, Adrian Aebischer, A. Ahmed, Yeap Chin Aik, H. Aikman, David Ainley (H.T. Harvey & Associates, inc.), A. Ajagbe, Abdi Ajama, David Akers (Environmental Protection Agency, Queensland Gov.), Ciro Albano (AQUASIS), Tamer Albayrak (Akdeniz University), Rachael Alderman (DPIW, Tasmania), Sergio

Alejandro, P.D Alexander-Marrack, Sônia Aline Roda (Centro de Pesquisas Ambientais do Nordeste), Sharif Al-Jbour (BirdLife International - Middle East Division), David Allan (University of Cape Town), D Allen, Gary Allport (BirdLife International), Dan Alon, Juan Carlos Alonso (Museo Nacional de Ciencias Naturales), J. Alonso Alvarez, Omar Al-Sagheir, Humberto Alvarez (Universidad del Valle), Jose Alvarez, M Alvarez, Maria Alice S. Alves, Fahrul P Amama (BirdLife Indonesia), Hitoha Amano, F. A Amidon (US Fish & Wildlife Service), Diane Amirault (Eastern Canada Piping Plover Recovery Team), James Faraco Amorim, John Bosco Amuno, Vasil Ananian, Michael Westerbjerg Andersen, Bjorn Anderson, Dave Anderson (Wake Forest University), Mark Anderson (North Cape Dep. of Tourism, Env. and Conservation), Brad A Andres (US Fish & Wildlife Service), Aristide Andrianarimisa (Wildlife Conservation Society), Y Andryucshenko, George Angehr (Panama Audubon Society), Fernando Angulo Pratolongo (Asociacion Cracidae Peru), A Antonchikov, Roger Applegate (Kansas Department of Wildlife & Parks), Hugo Aranibar-Rojas, J. Arata (University of Southern Chile), Carlos Otávio Araujo Guss, George Archibald (International Crane Foundation), José Manuel Arcos (SEO/BirdLife), M. M Argel-de-Oliveira, Marc Argeloo, D. P Armstrong, T. Arndt, Javier Arosemena, Yuri Artukhin (Russian Academy of Sciences), Augustus Asamoah, David Ascanio, John S. Ash, Simon Aspinall, Dylan Aspinwall, James Atherton, Ramana Athreya (Kaati Tours), Juan Carlos Atienza (Sociedad Española de Ornitología), J Atkins, Phil Atkinson (British Trust for Ornithology), Carole Attié (Ligue Pour La Protection des Oiseaux), Taku Awa, Hichem Azafzaf (Association "Les Amis des Oiseaux"), Adrián B. Azpiroz (University of Missouri-St. Louis), Marcus Babarskas (BirdLife International), Graeme Backhurst (East African ringing group, Nature Kenya), S. Baha El Din, Paul Baicich (National Wildlife Refuge Association), Jonathan Baillie (Institute of Zoology), I Bainbridge, Karen Baird (Kiwi Wildlife Tours), Barry Baker, E. Baker, Gillian Baker (Megapode Specialist Group), Helen C. Baker (US Fish & Wildlife Service), Liz Baker (Tanzania Bird Atlas Project), Neil Baker (Tanzania Bird Atlas Project), Paul E Baker (US Fish & Wildlife Service), David Baker-Gabb, P. Balakrishnan (SACON), Istvan Balazs (BirdLife Hungary), J. Balderama, Ozge Balkiz (Doga Dernegi), Greg Balogh (US Fish & Wildlife Service), Katya Balta, Mike J. Bamford (Bamford Consulting Ecologists), Paul Banko (US Geological Survey), Timothy Barabashin (Russian Bird Conservation Union), Hem Sagar Baral (Bird Conservation Nepal), Ian Barber (Royal Society for the Protection of Birds), Christophe Barbraud (Centre d'Etudes Biologiques de Chizé), Laurence Baria, Maribeth Baril (Haribon Foundation), Clive Barlow, Keith Barnes (BirdLife South Africa), J.M Barnett, Boris Barov (BirdLife International - European Division), Nicholas Barré (Société Calédonienne d'Ornithologie), Javier Barrio, Y. Barros, Trevor Bart, Mark Barter, Sandy Bartle (Museum of New Zealand), Shahid Bashir, Sagdan Baskaya, Nyambayar Batbayar (Wildlife Science and Conservation Centre), John M. Bates (Field Museum of Natural History Chicago), Julien Baudat-Franceschi (Société Calédonienne d'Ornithologie), Leandro Baumgarten (University of Campinas), Philippe Bayard (Parc National La Visite), Merryn Bayliss (Department of Conservation), Clive Bealey (World Pheasant Association), A. J. Beauchamp, Grant Beauprez (New Mexico Department of Game and Fish), R Beck, Dusti Becker (Maui Forest Bird Recovery Project), B. M. Beehler (Conservation International), Alfredo Begazo (University of Florida), R Behrstock, Ulf Beichle, Richard Beilfuss (International Crane Foundation), B. Bell, B. D. Bell (Wildlife

Management International), D. Bell (Wildlife Management International), Diana Bell (University of East Anglia), M. Bell, Ricardo Belmonte-Lopes, W Beltrán, L. Belyalova, G.A Bencke, Rosy Benitez, Sara Bennett (IUCN-SSC Cracid Specialist Group), Leon Bennun (BirdLife International), Joe Benshemesh, Phil Benstead (BirdLife International), K.S. Berg, Aldo Berruti (African Gamebird, Research, Education and Dev Trst), Douglas Bertram (Canadian Marbled Murrelet Recovery team), Adam Bester (Department of Conservation), W. Betz, Esteban Biamonte (Unión de Ornitólogos de Costa Rica), Carlos Bianchi (Oregon State University), J-P Biber, A. Birchenough, Jeremy Bird (BirdLife International), K. David Bishop (VENT Bird Tours), Peter Bishop, Andy Black (BirdLife International Global Seabird Programme), Jeff Black (Department of Wildlife, Humboldt State University), P. Blanco R., C. Blanvillain, John Blyth (Western Austr. Dept of Conserv. & Land Management), Dai Bo, Roberto Bócon, Alejandro Bodrati, P. D Boersma, Peter Boesman, Mark Bolton (University of Azores), Monica Bond (Center for Biological Diversity), Carlos Bonilla, Mark Bonta (Delta State University), A. M. Booth, García Borboroglu, Wendy D. Borello, John Borg (BirdLife Malta), Luca Borghesio (University of Illinois at Chicago), M.R Bornschein, Nick Borrow, Andressa Borsari, J. F. Bos, M Boschert, Andrés Bosso (Aves Argentinas/AOP), N. Bostock, Karen Bourgeois (Mediterranean Inst. for Ecology and Palaeoecology), Chris Bowden (Royal Society for the Protection of Birds), J. Bowen, Reed Bowman (Archibald Biological Station, Florida), S Boyd, A. Boyle, R. C Brace, Evgeny Bragin (Naurzum Natural Reserve), F. Brammer, Clait Braun (Grouse Inc.), Axel Braunlich, Vincent Bretagnolle (Centre d'Etudes Biologiques de Chizé), D Brewer, Chris Brewster, Nicholas Brickle (Wildlife Conservation Society), Joël Bried (Universidade dos Açores), Donald Brightsmith (Duke University), Kevin Brinck (US Geological Survey), Rachel Bristol (Nature Seychelles), Jorge Luis Brocca (Sociedad Ornitológica de la Hispaniola), M. Brombacher, Michael Brooke (University of Cambridge), Dan Brooks (Houston Museum of Natural Science), Tom Brooks (Conservation International), Joost Brouwer (Wageningen University), Koen Brouwer (Bioparc, Valencia), C. J. Brown, Chris Brown (Namibia Nature Foundation), Sarah Brown, Stephen Browne (Fauna and Flora International), Francis Bruner, Sávio Freire Bruno, Tim Brush (University of Texas - Pan American), Luis Gerado Bruzual, Sally Bryant (Parks & Wildlife Service, Hobart), P. J. Bubb, Graeme Buchanan (Royal Society for the Protection of Birds), David Buckingham, Paul Buckley (Royal Society for the Protection of Birds), Abner Bucol, Jose Bucol, Don Buden (College of Micronesia-FSM), Greg Budney (Cornell Laboratory of Ornithology), D. A. Buehler (University of Tennessee), Sebastian Bugariu (SOR/BirdLife Romania), Leandro Bugoni (University of Glasgow), Mazit Buketov (Association for Conservation of Biodiversity in KZ), Sergei Bukreev (Russian Bird Conservation Union), Nancy Bunberry, Allan Burbidge (Department of Environment & Conservation, WA), Andrew Burbidge (Department of Environment & Conservation, WA), Ian Burfield (BirdLife International - European Division), Neil Burgess (World Wildlife Fund), Jeff Burgett (US Fish & Wildlife Service), Angus Burns (Ekangala Grassland Trust), Fiona Burns (University of Bath), Ian Burrows, R. Burrows, D Busby, C. Bushell, E Bustamov, Stuart Butchart (BirdLife International), Greg Butcher (National Audubon Society), Tom Butynski (Bioko Biodiversity Protection Program), Dante Buzzetti (Centro de Estudios Ornitológicos), Achilles Byaruhanga (NatureUganda), Leonardo Cabrera, Des Callaghan (BirdLife International), Rob Calvert (BirdLife International), A Camina, Rick Camp

(US Geological Survey), Alberto Campos (AQUASIS), R. A. Canterbury, Lei Cao, David Capper (BirdLife International), Carles Carboneras (SEO/BirdLife), Iris Cardiel (Instituto de Investigación de Recursos Cinegéticos), Geoff Carey, Apolinario Carino, Nicholas Carlile (New South Wales National Parks & Wildlife Service), Graham Carpenter (Government of South Australia), John Carroll (Partridge, Quail & Francolin Specialist Group), Margaret Carswell, Andrew Carter (Charles Sturt University), Ian Carter (Natural England), José Luis Cartes (Guyra Paraguay), Mariana B Carvalho (Universidade Técnica de Lisboa), Hernan Casañas (Aves Argentinas/AOP), I Castro, Mike Catsis, Hong Chamnan (Wildlife Conservation Society), P. Champlin, Simba Chan (Wild Bird Society of Japan), Ding Chang-qing (Chinese Academy of Sciences), Tamra Chapman (Department of Environment & Conservation, WA), Vivien Chartendrault (Société Calédonienne d'Ornithologie), Giovanni Chaves, Johel Chaves-Campos, J. C. Chebez, Robert A Cheke (University of Greenwich), Yao Cheng-te, H. F. Cheung (Hong Kong Bird Watching Society), Susan L Childe, Brooks Childress, Anwaruddin Choudhury (The Rhino Foundation), Margaret Christian, Les Christidis (Museum Victoria), Patrice Christy, Gaasas Chunkino, Diego Cisneros-Heredia (Universidad San Francisco de Quito Quito), Geoffrey Citegetse (Assoc. Burundaise pour la Protection des Oiseaux), P Claffey, Greg Clancy (Dept of Zoology, University of New England), Bill Clark (Hawk Watch International), Rohan Clarke (Deakin University), Rob P Clay (BirdLife International), Tim Cleeves, Rob Clemens, Tom Clements (Wildlife Conservation Society), Jack Clinton Etniear (The Center for the Study of Tropical Birds), Ana José Cóbar Carranza (Universidad de San Carlos de Guatemala), Kristina Cockle, A. G Coelho, Callan Cohen (Percy FitzPatrick Institute of African Ornithology), Mario Cohn-Haft (National Institute for Amazonian Research), Ruth Cole (Mauritian Wildlife Foundation), Tom Coles, Nigel Collar (BirdLife International), Chris Collins (Wildwings), S. Colmé, Oliver Combres (National Avian Research Centre), Patrick Comins (Connecticut Audubon Society), Sheila Conant (University of awai'i), J. L. Confer (Ithaca College), Lizette Cook, Rosamonde Cook, Dan Cooper (California Audubon Society), John Cooper (Avian Demography Unit, Cape Town), Paul Coopmans, A Copland (BirdWatch Ireland), Geoff Copson (Parks and Wildlife Service, Tasmania), Norbert Cordeiro (University of Illinois at Chicago), John Corder (Pheasant Specialist Group), Andrea Corso, John E. Cortes (Gibraltar Ornithological and Natural History Socie), Oswaldo Cortes (Grupo Aves de Soata), Peter Cosgrove, F. Costa Straube, Malcolm C. Coulter (Wetlands International), Richard Craik, Rob Crawford (University of Cape Town), Will Cresswell (University of St. Andrews), Juan Criado (Sociedad Española de Ornitología), Andrew Cristinacce, Alain Crivelli (Pelican Specialist Group), Nicola Crockford (Royal Society for the Protection of Birds), Mike Crosby (BirdLife International), Antony Cross (Welsh Kite Trust), Gay Crowley, John Croxall (British Antarctic Survey), Richard Cruse, Francisco Cruz, Javier Cruz (Inst. Tecnológico de Estudios Sup. de Monterrey), Miguel Ángel Cruz-Nieto (Inst. Tecnológico de Estudios Sup. de Monterrey), F. Crystal, A. Cuervo, Susan Culliney, Eberhard Curio (PhilConserve), Dave Currie, Robert Curry (Villanova University), Odette Curtis (Percy FitzPatrick Institute of African Ornithology), Francesca J. Cuthbert (University of Minnesota), Richard Cuthbert (Royal Society for the Protection of Birds), F. P. da Fonseca Neto, J.M.C da Silva, Marcelo da Silva, Bhagawan Dahal, M. Dallimer (University of Edinburgh), Onoja Joseph Daniel (A.P. Leventis Ornithological Research

Institute), S. d'Assis Lima, C. Dau, L. Dávalos, Priya Davidar, Geoffrey Davidson (Malaysian Nature Society), Pete Davidson (BirdLife International), Charles Davies, Glyn Davies (Zoological Society of London), Robert Davies, Bradley Davis, Dawn Davis (University of Idaho), Susan Davis (University of Florida), Geoffrey Davison, G Day, Robert Day (ABR Inc. Environmental Research and Services), M. L de Brooke, Tina de Cruz (University of Otago), Juan Carlos de las Casas (Corporación Sentido Natural), Andre De Luca (SAVE Brasil), Y. de Melo Barros, Sidnei de Melo Dantas (Observadores de aves de Pernambuco), T. A. de Melo Júnior (Universidade Estadual Paulista), Rene de Roland, Gehan de Silva Wijeyeratne, Yves de Soye, Marcelo F. de Vasconcelos (Universidade Federal de Minas Gerais), T de Vries (Pontificia Universidad Católica del Ecuador), Richard Dean (Percy FitzPatrick Institute of African Ornithology), W. R. J Dean, Bernard Decueninck (Ligue Pour La Protection des Oiseaux), Rene Dekker (Megapode Specialist Group), Hugo del Castillo (Guyra Paraguay), Claudien Deliry, Cyrille Deliry, Ventzislav Delov (University of Sofia), John DeMarco (BirdLife International), Dean Demarest, L. Demeter, Ron Demey, Miro Demko (SOS/BirdLife Slovakia), J. P Demoncheaux, Francisco Voeroes Dénes (University of São Paulo), Susanne Dennings (Malleefowl Preservation Group Inc.), Sergey Dereliev (African-Eurasian Migratory Waterbird Agreement), Pedro Develey (SAVE Brasil), Adrian S Di Giacomo (Aves Argentinas/AOP), Alejandro G Di Giacomo (Aves Argentinas/AOP), S Di Giacomo, J. M. Diamond, Agis Dian (Burung Indonesia), David Díaz (BirdLife International), Victor Raúl Díaz Montes (Asociacion Cracidae Peru), Arleone Dibden-Young (Nene O Molokai), Jenny Dickson (Connecticut Dept. of Environmental Protection), Maria Diekmann (Rare and Endangered Species Trust), G Dijkman, Lars Dinesen (Ministry of Environment, Denmark), Mauro Diniz, Stephen J Dinsmore, Moussa Diop, Andrew Dixon (International Wildlife Consultants Ltd), Naomi Doak (Nature Seychelles), Tim Dodman (Wetlands International), Anita Donaghy (BirdWatch Ireland), Paul Donald (Royal Society for the Protection of Birds), Peter Donaldson, Thomas Donegan (University of Cambridge), Eric Dorfmann (Department of Conservation), K.Y. Dorji (Kuensal Newspaper), Michael Double (Australian National University), Hugh Doulton (Bristol Conservation and Science Foundation), J. E. Dowding, Simon Dowell (Liverpool John Moores University), Carl Downing, Robert J. Dowsett, Francoise Dowsett-Lemaire, Vicky Dreitz, N. P. Dreyer, Malcolm Drummond (Middelpunt Wetland Association), Will Duckworth (Wildlife Conservation Society), Bruce Dugger, J.B Dunning (University of Georgia), Guy Dutson (Birds Australia), Fern Duvall (Hawaiian Department of Land and Natural Resources), Melizar Duya (Conservation International Philippines), M. Dyer, Nick Dymond, W. Eakle, Jonathan C Eames (BirdLife International in Indochina), S. D. Earsom, C Eastwood, James Eaton (Birdtour Asia), S Eccles, Kelly Edmunds, David Edwards, N Efimenko, Knut Eisermann (PROEVAL RAXMU Bird Monitoring Program), Jack Eitniear (Centre for the Study of Tropical Birds Inc.), Robert Ekblom (Uppsala University), Guven Eken (Doga Dernegi), Jonathan Ekstrom (BirdLife International), Jennifer Ellard, Margus Ellermaa (BirdLife SUOMI-FINLAND), Chris Elphick (University of Connecticut), J. Elts, E Emanuelson, Juan José Ramos Encalado (SEO/BirdLife), Gunnar Engblom (Kolibri Expeditions), Andy Engilis, Jr. (University of California, Davis), Gökhane Engin, Ernesto C. Enkerlin-Hoeflich (Inst. Tecnológico de Estudios Sup. de Monterrey), K Erb, S Ericsson, Jens Eriksen, Patricia Escalante (CIPAMEX - Instituto de Biología), Virginia Escandell

(SEO/BirdLife), Alberto Esquivel, E.M.F. Esquivel, José A. Torres Esquivias (University of Córdoba), C Estades, V. B. Estelle, Jesus Estudillo López (Vida Silvestre), Johnathan Etzold, Mike Evans (BirdLife International), S. M. Evans, Steven W. Evans (Endangered Wildlife Trust), Tom Evans (Wildlife Conservation Society), John G Ewen (Zoological Society of London), David Ewert, Augustine U. Ezealor, P. Fabien, Woei-horng Fang, John H. Fanshawe (BirdLife International), Nestor Fariña, Chris Farmer (US Geological Survey), Marco Favero (University of Mar del Plata), I. Fefelov (Research Institute of Biology, Irkutsk University), P. Feldmann, John Fellowes (Kadoorie Farm and Botanic Garden), Eladio Fernandez (Hispaniolan Ornithological Society), A. Fernandez Badillo, Yves Ferrand, Birgit Fessl (Charles Darwin Research Station), Richard Ffrench, Chris Filardi (American Museum of Natural History), B Finch, D Finch, George Finney, Sally Fisher (BirdLife International), Lincoln Fishpool (BirdLife International), Jon Fjeldså (University of Copenhagen), Martin Flade (Brandenburg State Agency for Large Protected Areas), Jeremy Flanagan (ProAvesPerú), Knud Flensted (Dansk Ornitologisk Forening), Kevin Flesher (Centro de Estudos da Biodiversidade), B Fletcher, Beth Flint (US Fish & Wildlife Service), I. A. Flux, Asbjørn Folvik, Carla Suertegaray Fontana, Philip F Forboseh, Hugh Ford (Dept of Zoology, University of New England), B Forrester, M. S. Foster, Roger Fotso (Cameroon Biodiversity Conservation Society), Ian Fox (Department of Primary Industries and Fisheries, NT), Nick Fox, Rosendo Fraga (Aves Argentinas/AOP), Leonardo Fernandes França (Universidade de Brasília), Irma Franke (Museo de Historia Natural - UNMSM), Don Franklin (Charles Darwin University), William Fraser (Polar Oceans Research Group), Leonard Freed (University of Hawai'i), Alastair Freeman (Environmental Protection Agency, Queensland Gov.), Amanda Freeman (Centre for Field Studies, Yungaburra, Queensland), Holly Freifeld (US Fish & Wildlife Service), Juan Freile (BirdLife International), Wolfgang Fremuth (Frankfurt Zoological Society), Esteban Frere (BirdLife International), J. Fretz, Scott Fretz (Hawaii Division of Forestry and Wildlife), P. Frost, Richard Fuller (Partridge, Quail & Francolin Specialist Group), S Fundukchiev, George Gale (King Mongkut's University of Technology, Thonburi), Rosemary Gales (Tasmanian National Parks and Wildlife Service), T. Gallick, Eduardo Gallo-Cajiao (Fundación Ecohabitats), Umberto Gallo-Orsi (BirdLife International), Vladimir M. Galushin (Russian Bird Conservation Union), Lynn Gape (Bahamas National Trust), Eladio García (Universidad Autónoma de Madrid), P. García Borboroglu, Ignacio Garcia-Godos, Laura Gardner (Leeds Castle), Stephen Garnett (Charles Darwin University), Lucy Garrett (University of East Anglia), Richard Garrigues, Peter Garson (Pheasant Specialist Group), Mary E Gartshore (Bird Studies Canada), César Garzón (Fundación Zoobreviven), Angus Gascoigne (Gulf of Guinea Conservation Group), Chris Gaskin (Kiwi Wildlife Tours), Melvin Gastañaga (Asociación Armonía), L Gatarabirwa, Cassiano Gatto (SAVE Brasil), Alexander Gavashelishvili (Georgian Center for the Conservation of Wildlife), Maria Gavrilova (Arctic and Antarctic Research Institute), Peter Gaze, David Geale, B. Gee, Fulvio Genero (Corpo Forestale dello Stato), N. Gerhart, Justin Gerlach, John Gerwin, Mamikon Ghasabyan, Thomas Ghestemme (Société d'Etudes Ornithologiques de La Réunion), Kumar Ghorpade (University of Agricultural Sciences, Dharwar), Dipanka Ghose, Bradley Gibbons (Endangered Wildlife Trust), Richard Gibbons, David Gibbs, James Gibbs, G. Gil, James Gilardi (World Parrot Trust), Martin Gilbert (Wildlife Conservation Society), L. M. Gilissen, Jenny Gill (University of East Anglia), Robert E. Gill (US

Geological Survey), Eric Gilman (National Audubon Society), James Gilroy (BirdLife International), Weber Girao (AQUASIS), Mwangi Githiru (University of Antwerp), Jan Ove Gjershaug, J. M. Goerck (SAVE Brasil), Ramaz Gokhelashvili (Georgian Center for the Conservation of Wildlife), Isabel Gomez (Colección Boliviana de Fauna), Natalia Gomez (CVC Autoridad Regional), Héctor Gómez de Silva (Universidad Nacional Autónoma de México), L. P. Gonzaga, Manuel Gonzaga (Comunidad de Cochecorral), Juan Carlos Gonzalez, Oscar Gonzalez, Cristina González (SEO/BirdLife), Juan David González, Luis Mariano González (Ministerio de Medio Ambiente), Fernando González-García (Universidad Nacional Autónoma de México), M. L Goodwin, K.S. Gopi Sundar (Indian Cranes and Wetlands Working Group), Graham Gordon, Paul Goriup (Fieldfare International Ecological Development plc), Oleg Goroshko (Daursky State Nature Reserve), Marcos Gorresen (US Geological Survey), Ann Göth (Macquarie University), Anne Gouni (Société d'Ornithologie de Polynésie "Manu"), Karl-Heinz Grabowski, Juan Manuel Grande, A. Grant, John Grant, Jesse Grantham (Texas Audubon Society), R. Grantsau, Cheri L. Gratto-Trevor (Environment Canada), G Graves, Tom Gray (University of East Anglia), Andrew J. Green (Wildfowl and Wetlands Trust), Clay Green (US Fish & Wildlife Service), Peter Green (La Trobe University, Melbourne), Rhys Green (Royal Society for the Protection of Birds), Russ Greenberg (International Heron Specialist Group), T. Greene (Department of Conservation), Paul Greenfield (Fundación Jocotoco), Mark Gregory, Phil Gregory (Fieldguides Incorporated), A. Grieve, Tomás Grim (Dept. of Zoology, Palacký University), Richard Grimmett (BirdLife International Asia Division), Jim Groombridge (Durrell Institute of Conservation and Ecology), Manuel Grosselet, J. A Grzybowski (University of Central Oklahoma), Marion Gschweng, Carlos Guerra, D. Guicking, Mauro Guimarães Diniz, T Gullick, Helen Gummer (Department of Conservation), Carlos Otávio Araujo Gussoni (Centro de Estudos Ornitológicos), Ian Gynther, H. Hafner (International Heron Specialist Group), Christian Hagen (Oregon Department of Fish and Wildlife), Ingo Hahn, Susan Haig (International Piping Plover Recovery Group), Mehd Halaouate, Ronald Halder (Nature Conservation Committee), David Hall, Philip Hall (Pro Natura International), B Hallmann, Gergo Halmos (BirdLife Hungary), Steve Hamilton, Pete Hancock (BirdLife Botswana), F Hannecart, Phil Hansbro, Louis Hansen (University of Copenhagen), James Hardcastle, Matt Harding (BirdLife International), Carol Harker, Kim Hark-Jin (Kyung Hee University), Dan Harley (Dept for Environment and Heritage), Grant Harper (Department of Conservation), Simon Harrap, Brian Harrington (Manomet Centre for Conservation Sciences), Clive Harris (World Bank), Jim Harris (International Crane Foundation), C.S. Harrison, John Hart (Wildlife Conservation Society), Bill Harvey, Hiroshi Hasegawa (Toho University), Jess Hatchett (BirdLife International), Ohad Hatzofe (Israel Nature and Parks Authority), Jens Haugaard, Frank Hawkins (Conservation International), Nate Hawley (Division of Fish and Wildlife), R. Hay, Floyd E. Hayes (University of the West Indies), P. Hayman, A. Haynes Sutton (The University of the West Indies), Cornelis Hazeveld (Universidade de Lisboa), Fen-Qi He (Institute of Zoology, Academia Sinica, Beijing), Susan Healy (Sacramento Zoo), Lawrence Heaney (Field Museum of Natural History Chicago), Ann Hecht (US Fish & Wildlife Service), Scott Hecker (National Audubon Society), C. J Heij (Natural History Museum, Rotterdam), Thomas Heinicke, Carlo Heip (Netherlands Institute of Ecology), A. Bennett Hennessey (Asociación Armonía), Janos Hennicke (Centre d'Etudes

Biologique de Chizé), H Hering, J Hering, Kerryn Herman, . Hermanto, Fidel Hernandez, J. F. Hernandez, Alejandro Hernandez-Jaramillo, Sergi Herrando (Catalan Ornithological Institute), Marc Herremans (Royal Museum for Central Africa), Mauricio Herrera, S. K. Herzog (Asociación Armonía), A Hesse, Charles Hesse, Jeremy Hickman, Alawi Hija (Ministry of Environment (Zanzibar)), Geoff Hilton (Royal Society for the Protection of Birds), Craig Hilton-Taylor (IUCN SSC), S. L Hilty, Chris Hines (The Namibian Naturalist), Rod Hitchmough (Department of Conservation), T Hjarsen, Dion Hobcroft, Peter Hodum (Oikonos), Paquita Hoeck (University of Zürich), Tor Egil Hoegsaas, Randy Hoffman, Remco Hofland, Sebastien Hogberg, Tod Hogrefe (Michigan Dept. of Natural Resources), Richard Holdaway, Mark Holdsworth (Orange-bellied Parrot Recovery Program), Matt Holloran (National Audubon Society), Derek Holmes (Indonesian Ornithological Society), Tim Holmes (Queensland Environmental Protection Agency), D.T. Holyoak, Murray Honick, David Hooper, Helen Horblit (Island Endemics Foundation/Endémicos Insulares), J. Hornbuckle, Jesper Hornskov, Eric Horstman (Fundación Pro-Bosque), Márton Horváth, Pete Hosner, Pavel Hospodarsky, Herman Hötker (Naturschutzbund Deutschland), Dave Houston (Department of Conservation), Steve Howell (Point Reyes Bird Observatory), Rich Hoyer, Wayne Hsu, T. Htin Hla (Biodiversity and Nature Conservation Association), Darcy Hu (US National Parks Service), A. Huanca-Llanos (Asociación Armonía), X Huang, F. Huettmann, Baz Hughes (Wildfowl and Wetlands Trust), Nic Huin (Falklands Conservation), Dan Hulea (Romanian Ornithological Society), Kit Hustler, Robert Hutchinson, Robert E Hyman (The Explorers Club), Colleen Hyslop (Canadian Wildlife Service), Apirat Iamsiri (King Mongkut's University of Technology, Thonburi), Petar Iankov (Bulgarian Society for the Protection of Birds), Jayson Ibanez (Philippine Eagle Foundation), Beatrice Ibene, Wed Abdel Latif Ibrahim (Egyptian Environmental Affairs Agency), Ana Ignacio (SEO/BirdLife), M. Iles, Juan Carlos Illera (IPNA-CSIC), Jeri Imansyah (Komodo Survival Program), Michael Imber, Santiago Imberti, Eva Inderwildi (Schweizer Vogelschutz SVS-BirdLife Schweiz/ASPO Bi), M. Indrawan, Johan Ingels, Rebecca Ingham (Falklands Conservation), Eduardo Inigo (Cornell Laboratory of Ornithology), Ana Iñigo (Sociedad Española de Ornitología), John Innes, Carol Inskip, Muhammad Iqbal, M.P.S Irwin, Paul Isenmann (Centre d'Ecologie Fonctionnelle et Evolutive), Süreyya Isfendiyaroglu (Doga Dernegi), Isabel Isherwood (BirdLife International), Farah Ishtiaq, Zafar-ul Islam (Bombay Natural History Society), M Isler, P Isler, Colin Jackson (A Rocha), J. A. Jackson, Roger Jaensch (Wetlands International), Olaf Jahn (Aves & Conservación and Fundación EcoCiencia), Carol James (Guardian Life Wildlife Trust), David James (AECOM), Roger James (Conservation International), L. Jammes, P. Jansen, Paul Jansen (Department of Conservation), Alvaro P. Jaramillo, Girish Jathar, Salim Javed (Environmental Research & Wildlife Devel. Agency), Praveen Jayadevan, Mick Jeffery (Parks Australia), Andrew Jenkins (Percy FitzPatrick Institute of African Ornithology), Clinton Jenkins, Mike Jennings, Frédéric Jiguet (Muséum National d'Histoire Naturelle, Paris), Gustavo Jimenez-Uzcategui, Jasson John (Wildlife Conservation Society of Tanzania), Lyndon John, Richard Johnson, C. Jolivet, Carl Jones (Mauritian Wildlife Foundation), Clare Jones, P Jones, Stephanie L. Jones (US Fish & Wildlife Service), Vicky Jones (BirdLife International), Leo Joseph (CSIRO Sustainable Ecosystems), Marcos Juárez, Mery Juiña, Peter Kaestner, Adrian Kahemela (Tanzania Forest Conservation Group), Andres Kalamees (Eesti Ornitoloogiaühing (EOÜ)), John

Atle Kålås (Norsk Institutt for Naturforskning), Portiphar Kaliba (Malawi Ornithological Society), Rajiv Kalsi (M.L.N. College), Chinthaka Kaluthota (Field Ornithology Group of Sri Lanka), Chinthaka Kaluthota (FOGSL), M Kalyakin, Johannes Kamp (Universitat Oldenburg), Ian Karika, Jordan Karubian (University of California, Los Angeles), Igor Karyakin (Center of Field Studies), Raju Kasambe, R Kashkarov, Andrew Kasner, Kazuaki Kato (Wild Bird Society of Japan), Todd Katzner (National Aviary), Rahul Kaul (IUCN SSC), Kazuto Kawakami (Forestry and Forest Products Research Institute), Aidan Keane (World Pheasant Association), J. Kearvell, Rachael Keedwell, Oskars Keiss, Allan Keith, Brad Keitt (Island Conservation), Verena Keller (Swiss Ornithological Institute), David Kelly (Trinity College Dublin), Jessica Kemper, J. E. Kennamer, P. Kennerley, Robert Kenward (Natural Environment Research Council), Omaliss Keo (University of East Anglia), A. K. Kepler, Dylan Kesler (University of Missouri-Columbia), M. Kessler, E Keuzberg-Makhina, Harry Keys, Aleem Ahmed Khan (Ornithological Society of Pakistan), Sam Khosravifard, Valery Khrokov (Association for Conservation of Biodiversity in KZ), Lloyd Kiff (The Peregrine Fund), Felician Kilahama (Tanzanian Forestry and Beekeeping Division), Mike Kilburn, Seng Kim Hout, D. King, Howard King (Bahrain Bird Recorder), Margaret Kinnaird (Wildlife Conservation Society), Matt Kirchhoff (Alaska Department of Fish and Game), Arturo Kirkconnell (Museo Nacional de Historia Natural), Roger Kirkwood, G. M. Kirwan, K. M. Kisokau, Kapanya Kitaba, Siegi Klaus, J. Klavitter, N Klein, Sonia Kleindorfer, Louri Klemann Jr., Erik Klop (Leiden University), S Knapp, Barbara Knapton, G Knauf, F. L. Knopf, S Koenig, Kees Koffijberg (SOVON Voogelonderzoek Nederland), Vladimir Kolbintzev (Aksu-Zabagly Natural Reserve), Oliver Komar (SalvaNATURA Conservation Science Program), Yukihiro Kominami (Wild Bird Society of Japan), Aleksey Koshkin (Korgalzhyn Nature Reserve), Maxim Koshkin (Association for Conservation of Biodiversity in KZ), Sarath W. Kotagama (Field Ornithology Group of Sri Lanka), András Kovács, Anatoliy Kovshar (Institute of Zoology), Niels Krabbe (Zoological Museum, University of Copenhagen), Stefan Kreft (University of Hamburg), Jörg S. Kretzschmar (Gesellschaft für Technische Zusammenarbeit (GTZ)), E. Kreuzberg-Mukhina, Ken Kriese (University of California, Davis), Hans Krüse (Vogelbescherming Nederland), G. R Kula, Kathy Kuletz (US Fish & Wildlife Service), Suresh Kumar, Jim Kushlan (Heron Specialist Group), Geoff Lacey, Lars Lachmann (Royal Society for the Protection of Birds), Clif Ladd, Jacques Laesser, Karen Laing (US Fish & Wildlife Service), Chris Lalas, Frank Lambert, J. Martjan Lammertink (Cornell Laboratory of Ornithology), Richard Lanctot (US Fish & Wildlife Service), Daniel Lane (LSU Museum of Natural Science), Olivier Langrand (Conservation International), Marc Languy (WWF-EARPO), E Lanovenko, Peter Lansley, R. Laps, Ben Lascelles (BirdLife International), Lucia L Lastimoza (Mari-it Wildlife Conservation Park), S. Latta, Michael Lau (Kadoorie Farm and Botanic Garden), Fred Launay (Environmental Research & Wildlife Devel. Agency), Oscar Laverde, M. Lawrence, Matthieu Le Corre (Centre d'Etudes Biologiques de Chizé), B. Leachman, Paul Leader, T. Leary, Alan Lee (Manchester Metropolitan University), D.S. Lee, Hansoo Lee (Ornithological Society of Korea), Alex Lees (University of East Anglia), Sarah Legge (Australian Wildlife Conservancy), Teemu Lehtiniemi (BirdLife SUOMI-FINLAND), Luc Lens (Ghent University), A. Lentino, David Leonard (Dept of Land and Natural Resources, Hawaii), Pete Leonard, Jaan Lepson, Jean-Marc Lernould (Parc Zoologique et Botanique de la Ville de Mulhou), Arne Lesterhuis (Guyra

Paraguay), Richard Lethwaite, Yves Létocart (Parc Provincial de la Rivière Bleue - Province Sud), Anthony Levesque (Reserve Naturelle des îlets de la Petite-Terre), A Levin, C. Levy, R. Lewis (Durrell Wildlife Conservation Trust), Rebecca Lewison (Duke University), Richard Lewthwaite (Hong Kong Bird Watching Society), Zuo Wei David Li (Wetlands International), Liang (Hainan Normal University), Han Lianxian, S. Liao (Changhua Wild Bird Society), Alan Lieberman (Zoological Society of San Diego), Durwyn Liley, P. C. Lima, Ricardo Lima (University of Lancaster), Cara Lin Bridgeman, Lars Lindell (Sveriges Ornitologiska Förening), K. Lindsay (Island Resources Foundation), Jeremy Lindsell (Royal Society for the Protection of Birds), Åke Lindström (Dept. of Animal Ecology, Lund University), . Liu Dongping (Anatidae Task force), Huw Lloyd (Manchester Metropolitan University), John Lloyd, P. Lobo, M. Lockwood, Asko Löhmas (University of Tartu), Peter Long (University of Bath), Leonardo E Lopes, B. López-Lanús, Juan Antonio Lorenzo (SEO/BirdLife), Michael Louette (Royal Museum for Central Africa), Tim Low (University of Queensland), James Lowen (BirdLife International), Richard H. Loyn (Arthur Rylah Institute for Environmental Research), Xin Lu (Wuhan University), R. Lucking, Lawrence Luhanga (Malawi Ornithological Society), Édson Ribeiro Luiz (SAVE Brasil), J. Lyons, I. MacAllan, Aidan McCormack (University of Glasgow), Mark A MacDonald (University of New Brunswick), Érika Machado (University of São Paulo), Claudia Macias-Caballero (Inst. Tecnológico de Estudios Sup. de Monterrey), Andy Mack (Wildlife Conservation Society), R. D. Mackay, Barbara MacKinnon, Ross MacLeod (University of Glasgow), Jeremy Madeiros (Bermuda Audubon Society), Alberto Madroño (Sociedad Española de Ornitología), Gopinathan Maheswaran (Bombay Nat. History Soc/Zoological Survey of India), Simon Mahood (BirdLife International), Fiona Maisels (Wildlife Conservation Society), P. Majluf, Gustavo Malacco (Universidade Federal de Uberlândia), Richard Malone (Department of Conservation), Lucy Malpas (BirdLife International), Ubbo Mammen (Institut für Zoologie, Halle), Clive Mann, Adrian Manning (Australian National University), E.F. Mansur (Universidade do Estado do Rio de Janeiro), Shiiwua Manu (Nigerian Conservation Foundation), P. Manzano, David Maphisa (Percy FitzPatrick Institute of African Ornithology), Ma. Consuelo Marín Togo (Universidad Michoacana de San Nicolas de Hidalgo), Miguel Ângelo Marini (Universidade de Brasília), T Mark, Jeff Marks (Montana Audubon Society), Todd Marks, Charles Marsh, Annie Marshall (US Fish & Wildlife Service), Tony Martin (British Antarctic Survey), C. Martínez, Juan Esteban Martínez-Gómez (Island Endemics Foundation/Endémicos Insulares), M Martínez-Morales, Rod Martins (BirdLife International), Claiton Martins-Ferreira, Wayne Martinson, P Martuscelli, L Marzariegos, Vilikesa Masibalavu (BirdLife International - Fiji programme), G Matekova, C. Matevalea, Michael Mathieson (Environmental Protection Agency, Queensland Gov.), Paul Matiku (Nature Kenya), S. Maturin, Iwein Mauro, Peter Mawson (Department of Environment & Conservation, WA), Sjoerd Mayer (Bird Songs International), Juan Mazar Barnett (Museo Argentino de Ciencias Naturales), Rachel McClellan (BirdLife International), Pete J McClelland (Department of Conservation), Gerald McCormack (Cook Islands Natural Heritage Project), Neil McCulloch (Royal Society for the Protection of Birds), K McFarland, Phil McGowan (World Pheasant Association), Mike McGrady (Natural Research Ltd), Bill McIver, Miguel McMinn, Thomas McNish (CORALINA), Wina Meckvichai (Chulalongkorn University), A Mee, David Mee (Sheffield University), Prachi Mehta,

Lota Melamari (Wildlife Society of Tanzania), Richard Mellanby (University of Glasgow), Martim Melo (University of Edinburgh), Tadeu Melo Júnior, Stephanie Melville, Patricio Mena-Valenzuela (Fundación EcoCiencia), E Mendonça, Dilia Menezes (Serviço do Parque Natural da Madeira), Peter Menkhorst (DSE, Victoria), Emmanuel Ménoni, Cendrine Meresse, Jean-Marc Mériot (Parc Provincial de la Rivière Bleue - Province Sud), Don Merton (Department of Conservation), B. M. Metcalf (Bamford Consulting Ecologists), Johanna Mew (Fundación Awacachi), Bernd Meyberg (Martin Luther University), J. -Y. Meyer, Anton Mezhnev, T. Micol, Alexander Mikityuk (Ukrainian Union for Bird Conservation), C Milensky, C Miljeteig, Bruce W. Miller, Carolyn M. Miller, James Millett (BirdLife International - Fiji programme), Linda Millington (Rare and Endangered Species Trust), Michael Mills (Percy FitzPatrick Institute of African Ornithology), Jeremy Minns, Aymeric Mionnet (Ligue Pour La Protection des Oiseaux), Kathleen Misajon (US National Parks Service), Alexander L. Mischenko (Russian Bird Conservation Union), Tino Mischler, John Miskell (CARE International), Colin Miskelly (Department of Conservation), Andy Mitchell, Liz Mitchell (Seabird Bycatch Project), Simon Mitchell (BirdLife International), M Mitropolskyi, O Mitropolskyi, C. W Moeliker (Natural History Museum, Rotterdam), Lalit Mohan, Yair Guillermo Molina, Janice Molloy (Department of Conservation), G Montañez, Antonio Monteiro, José Luis Brito Montero, Tiberio C. Monterrubio-Rico (Universidad Michoacana de San Nicolas de Hidalgo), Denny Moore (Bahamas National Trust), Peter Moore (Department of Conservation), Nial Moores (UPO Wetlands Centre), Ron Moorhouse (Department of Conservation), Jose Morales (Empresa para la Conservacion de la Flora y la Faun), Alex More, Ian Moreley, Marie Morin (Portland Community College), Forest Morning, Vladimir Morozov (Zoological Museum, Moscow State University), Pete Morris, Kerryn Morrison (ICF/EWT Partnership), Matthew Morten, John Morton (US Fish & Wildlife Service), Valery Mosejikin (Russian Bird Conservation Union), Hanna Mounce (Maui Forest Bird Recovery Project), David Moyer (Wildlife Conservation Society), H. G. Msiska, M. Msuha, Giles Mulholland, Emile Mulotwa (University of Kisangani), Elia A Mulungu, Dwi Mulyawati (Burung Indonesia), Taej Mundkur (Wetlands International), P. Mundy, Grant Munro (Falklands Conservation), Dan Munteanu (Romanian Ornithological Society), P Murphy, Dave P. Murray (Department of Conservation), Simon Mustoe (Applied Ecology Solutions Pty Ltd), Kiragu Mwangi (BirdLife International), Susan Myers, Szabolcs Nagy (BirdLife International - European Division), L. N Naka, Kazuya Naoki, Rishad Naoroji (Bombay Natural History Society), João Luiz X Nascimento, Oliver Naswira, Lelis Navarete, A. G. Navarro, Rab Nawaz (Palas Conservation and Development Project), Paul K. Ndang'ang'a (BirdLife International - Africa), Margareth Nderumaki (Tanzania Forest Conservation Group), A.J Negret, Deon Nel (WWF South Africa), Howard Nelson (Pawi Study Group), Jay Nelson (US Fish & Wildlife Service), Erwin Nemeth (Konrad Lorenz Intstitute for Ethology), Joaquim R. S. Neto, Santos D'Angelo Neto, Duncan Neville, Peter Newberry (Royal Society for the Protection of Birds), N Newfield, Peter Newton (BirdLife International), R. Nichols (Queen Mary University of London), Vincent Nijman, Elvira Nikolenko, Ivailo Nikolov, Francis Njie, Peter Njoroge (National Museums of Kenya), Claudien Nsabagasani, Alessandro Pacheco Nunes, Rosek Nursahid (ProFauna Indonesia), Terry B. Oatley (Avian Demography Unit, Cape Town), Andrew O'Brien (BirdLife International), Mark O'Brien (Royal Society for the Protection of

Birds), Tim O'Brien (Wildlife Conservation Society), José Manuel Ochoa (SAO), James O'Connor (Birds Australia), Jody O'Connor, Shaun O'Connor (Department of Conservation), Eric Odell (Colorado Division of Wildlife), C. O'Donnell, Dennis O'Dowd (Monash University), Mike Ogle (Department of Conservation), I. J. Oien (Norsk Ornitologisk Forening), J. Øien, Ebwekoh O'Kah (World Wide Fund for Nature), Masaki Okuyama (Japanese Ministry of the Environment), Diego Garcia Olaechea, Luis Germán Olarte (SAO), Paulo Oliveira (Serviço do Parque Natural da Madeira), Damien Oliver (NSW National Parks and Wildlife Service), William Oliver, Adan Oliveras de Ita (Universidad Nacional Autónoma de México), Fabio Olmos, Silas Olofson, Penny Olsen (Australian National University), Ortac Omnis (Doga Dernegi), John O'Neill, Y. Oniki, Koji Ono (Kushiro Nature Conservation Office), Yo Onon (WWF (Mongolia)), Juan Pablo Ordóñez, E Orejuela, Daniel Oro (Institut Mediterrani d'Estudis Avançats), Sonia Gabriela Ortiz-Maciel (Inst. Tecnológico de Estudios Sup. de Monterrey), Raúl Ortiz-Pulido (Universidad Autónoma del Estado de Hidalgo), R Otoch, Otte Ottema, Kiyoshi Ozaki (Bird Migration Research Center), José Fernando Pacheco (Federal University of Rio de Janeiro), Alexander Pack-Blumenau, Lisa Marie J. Paguntalan (Cebu Biodiversity Conservation Foundation), Debbie Pain (Royal Society for the Protection of Birds), Byron Palacios (Royal Society for the Protection of Birds), Eduardo Palacios, Peter Palatitz (BirdLife Hungary), T Palliser, Bruce Palmer (US Fish & Wildlife Service), Massimo Pandolfi (University of Urbino, Italy), Mireille Pandolfi, C. Papaconstantinou, Tamás Papp, Mikhail Parilov, Vincent Parker (Endangered Wildlife Trust), Mike J. Parr (American Bird Conservancy), Steve Parr (Royal Society for the Protection of Birds), Jorge Enrique Parra, R. Parrini, R. Parrish, Abida Parveen (Ornithological Society of Pakistan), M. Pascal, David N. Pashley (American Bird Conservancy), David Paton (University of Adelaide), Michael Patrikeev, Donna Patterson-Fraser (Polar Oceans Research Group), Rich Paul, Iubatā R Paula de Faria, Rebecca Peak, James Pearce-Higgins (Royal Society for the Protection of Birds), Mark Pearman, David Pearson, Peter Pechacek, Lynn Pedler (Government of South Australia), R. Pedraza (Sierra Gorda), Junior Pedro, Nic Peet (BirdLife International), Liu Peiqi, Liba Pejchar (Stanford University), C. Peña, J Penhallurick, Jay Penniman (Dept of Land and Natural Resources, Hawaii), J Perez, Nelson Pérez, Monica Pérez-Villafaña, Bou Peters, A. T. Peterson, David Peterson, Nicky Petkov (Bulgarian Society for the Protection of Birds), P. Petracci (Falklands Conservation), Otto Pfister, Richard Phillips (British Antarctic Survey), Vitor Piacentini, A. D. Piazza, Lorien Pichegru (FitzPatrick Institute, University of Cape Town), Andy Pierce, R Pierce, Ray Pierce (Eco Oceania Ltd), Stefan Pihl, John Pilgrim (BirdLife International), Stuart L. Pimm (Duke University), Ding Ping (Zhejiang University), Renato Pinheiro, Thieres Pinto (AQUASIS), D Pioli, Pierre Pistorius, Jeanne Marie Pittman (Wattled Crane Recovery Programme), Manuel A. Plenge, J. H. Plissner, Andy Plumptre (Wildlife Conservation Society), Edward Pollard (Wildlife Conservation Society), Derek Pomeroy (Makerere University), Colin Poole (Wildlife Conservation Society), S. Poon, Rob Pople (BirdLife International - European Division), Bill Porteous, Richard Porter (BirdLife International), Eugene Potapov (Russian Working Group on Birds of Prey), Michael Poulsen (Nordic Agency for Development and Ecology), Hernán Povedano, Nikolay Poyarkov, Nyls de Pracontal, Rebecca Pradhan (Royal Society for the Protection of Nature), Nichaya Praditsup, Vibhu Prakash (Bombay Natural History Society), Anand Prasad, Tony Prater (Royal Society for the Protection of Birds), H.

Douglas Pratt (North Carolina State Museum of Natural Sciences), Thane Pratt (US Geological Survey), J. Praveen, D.R.C Prescott (Alberta NAWMP Centre), Catherine Price (Department of Environment & Climate Change), David Priddel (Department of Environment & Conservation, NSW), P. Primot, M. Prince, J Pryor, P. C. Pulgarín, Tony Pym, Rivo Rabarisoa (BirdLife Madagascar), Marc Rabenandrasana (Asity: Ligue Malagache pour la Protec. des Oiseaux), Edmunds Racinskis (Latvijas Ornitologijas Biedriba), Kate Rae (Wild Camel Protection Foundation), K Rafeek, Asad Rahmani (Bombay Natural History Society), Hugo Rainey (Wildlife Conservation Society), K. Ramesh (Wildlife Institute of India), Iván Ramírez (Sociedade Portuguesa para o Estudo das Aves), J. A. Ramos, Ettore Randi (Instituto Nazionale per la Fauna Selvatica), Jan F. Rasmussen, Pamela Rasmussen (National Museum of Natural History, Washington), Norman Ratcliffe (Royal Society for the Protection of Birds), Harifidy Rakoto Ratsimba, Liutauras Raudonikis (Lietuvos Ornitologu Draugija), Philippe Raust (Société d'Ornithologie de Polynésie "Manu"), Mark Rauzon, Houssein Rayaleh (Djibouti Nature), Matt Rayner, B Raynor, Félix Razafindrajao (Durrell Wildlife Conservation Trust), Michael Reed (Tufts University), Bruce Reid (Mississippi Audubon Society), Fiona Reid, H Reid, M Reid, Paul Reillo (Rare Species Conservatory Foundation), B.L Reinert (Mater Natura Instituto de Estudos Ambientais), J. Van Remsen (Museum of Natural Science), Alex Renaudier, Lily Arison Réné De Roland (The Peregrine Fund), Luis Miguel Renjifo (Instituto Alexander Von Humboldt), Katherine Renton (Estacion de Biología Chamela), Robin Restall (Colección Ornitológica Phelps), Nicolás Rey (Conservación Argentina), Michelle Reynolds (US Geological Survey), Frank Rheindt, Edison Ribeiro (SAVE Brasil), Rômulo Ribon, David G. Ricalde, G. Richards, Robert S. Ridgely (American Bird Conservancy), Jon Riley, David Rimlinger (San Diego Zoo), Chris Rimmer (Vermont Institute of Natural Science), Margarita Rios, S.D. Ripley, R. Riseborough, George Ritchotte (US Geological Survey), Javier Rivas (Universidad de San Carlos de Guatemala), Kim Rivera (US National Marine Fisheries Service), Luis Rivera, Frank Rivera-Milan (US Fish & Wildlife Service), Shaikh Riyazuddin, M.B Robbins, A. D. Roberts, Pauline Roberts (Hawaii Division of Forestry and Wildlife), Christopher Robertson (Wild Press Laboratory), Graham Robertson (Australian Antarctic Division), Hugh A. Robertson (Department of Conservation), Iain Robertson, Pete Robertson (BirdLife International), V. V. Robin, O Robinet, Milena Roca, Gerard Rocamora (Island Conservation Society/MNHN Paris Museum), G. Rocha, Omar Rocha (Wildlife Conservation Society), Dave Rockingham-Gill (BirdLife Zimbabwe), Sonia Roda, Gordon Rodda (US Fish & Wildlife Service), Randy Rodgers (Kansas Department of Wildlife & Parks), Rafy Rodriguez, Jean-Paul Rodríguez (Centro de Ecología - IVIC), Ricardo Rodríguez-Estrella, Ignacio Roesler, Danny Rogers, Abraham Rojas (Asociación Armonía), V Rojas, Franklin Rojas-Suárez (Conservation International), Tom Skovlund Romdal (Zoological Museum, University of Copenhagen), Wouter Rommens, Guy Rondeau (Africa Nature International), G. H. Rosenberg, Ken Rosenberg (Cornell Laboratory of Ornithology), J. Rossouw, P. Round, David Rounsevell, Sophie Rouys (Conservation Research New Caledonia), John Rowden (Wildlife Conservation Society), Beau Rowlands, R. A. Rowlett (Fieldguides Incorporated), Jason Roxburgh (Department of Conservation), Lizanne Roxburgh (Percy FitzPatrick Institute of African Ornithology), Ian Rudd, Peter Rudolph Rudyanto (BirdLife International Asia Division), Stephen Rumsey, Adrian Eisen Rupp, Bonnie Rusk (Grenada Dove Research Coordinator), Bob

Russell, R. Rustem, Peter G. Ryan (Percy FitzPatrick Institute of African Ornithology), David Caro Sabogal, Roger Safford (BirdLife International), Francisco Sagot-Martin, Paul G. W Salaman (World Land Trust-US), J Salgado, Alejandro Salinas, V. Samarawickrama, Chuum Samnang (World Pheasant Association), Sidnei Sampaio, Beatriz Sánchez (Sociedad Española de Ornitología), César Sánchez (Unión de Ornitólogos de Costa Rica), Julio E. Sánchez (Unión de Ornitólogos de Costa Rica), Allan Sander, Sarah Sanders (Royal Society for the Protection of Birds), Attila Sandor (SOR/BirdLife Romania), Luis Sandoval (Unión de Ornitólogos de Costa Rica), Ravi Sankaran, Marcos P. Santos (Museu Goeldi), D.E Sargeant, Ria Saryanthy (BirdLife Indonesia), Ed Saul, Alan Saunders (Department of Conservation), Debbie Saunders (Department of Environment & Conservation, NSW), Denis Saunders (CSIRO Sustainable Ecosystems), Don Saunders, Sav Saville (Wrybill Birding Tours), Corodius Sawe (Amami Nature Reserve), S. Sawyer, Elinor Scambler (Australian Crane Network), Martin Schaefer (Fundación Jocotoco), Norbert Schäffer (Royal Society for the Protection of Birds), Scherezino B. Scherer (IBAMA - CEMAVE), Adrian Schiavini (Universidad Nacional de la Patagonia Austral), R. Schlatter, Frances A. Schmeichel (Department of Conservation), Veronika Schmidt (Fundación Jocotoco), Doug Schoeling (Oklahoma Department of Wildlife Conservation), Jonny Schoenjahn, Paul Schofield (Canterbury Museum), E. A. Schreiber, Thomas Schulenberg (Field Museum of Natural History Chicago), A. Schulz Neto, Paul Scofield (Canterbury Museum), Ann Scott (Namibia Crane Working Group), Derek Scott, J. Michael Scott (University of Idaho), Mike Scott (Namibia Crane Working Group), Anthony Sebastian (Malaysian Nature Society), Nathalie Seddon (University of Cambridge), José Segovia, Sam The Seing (The Peregrine Fund), Cagan Sekercioglu, Gianluca Serra, Grace Servat (University of Missouri-St. Louis), Victor Setina, G Seutin, Lucia Liu Severinghaus, Heiko Seyer, Clifford, E Shackleford (Texas Parks and Wildlife Department), Scott Shaffer (University of California Santa Cruz), Nirmal J. Shah (Nature Seychelles), Rob Shallenberger (The Nature Conservancy), Noam Shany, Suresh Sharma, Chris J. Sharpe, Kevin Shaw (Western Cape Nature Conservation Board), Phil Shaw (University of St. Andrews), Kashif M. Sheikh, Rob Sheldon (Royal Society for the Protection of Birds), Chris Shepherd (TRAFFIC Southeast Asia), Jevgeni Shergalin, Greg H. Sherley (Department of Conservation), Thomas Sherry, Anteneh Shimelis (Ethiopian Wildlife and Natural History Society), Hadoram Shirihai, Mohammed Shobrak (National Wildlife Research Centre), Sue Shutes (BirdLife International), Paul Sievert (University of Massachusetts), Luis L. Silva, Natalia Silva (Fundacion ProAves), P Silva, R Silva, S Silva, Luís Fábio Silveira (University of São Paulo), Alejandro Simeone, Robert E. Simmons (FitzPatrick Institute, University of Cape Town), J. C Simon, N. Simpson, Ian Sinclair, Arun P. Singh (Forest Research Institute, India), Paras Singh (Bird Conservation Nepal), Udaya Sirivardana (Ceylon Bird Club), Kipusumy Sivakumar (Wildlife Institute of India), A. Skerrett (Island Conservation Society), Sergey Sklyarenko (Association for the Conservation of Biodiversity), Cleo Small (BirdLife International Global Seabird Programme), Jon Smallie (Endangered Wildlife Trust), M. Smart, Sergei Smirenski (International Crane Foundation), Ken Smith (Royal Society for the Protection of Birds), Neil Smith (BirdLife South Africa), T Snetsinger, Alejandro Solano, N Soldatova, C. Solek, Diana Solovieva (Wrangel Island State Reserve), S Somasundaram (SACON), O Sopyev, Lisa Sorenson (Center for Ecology and Conservation Biology), P. Sornoza,

Fernando Sornoza Molina (Fundación Jocotoco), Michele Sorrenti, Jerome Spaggiari (Conservation International), Svetoslav Spasov (Bulgarian Society for the Protection of Birds), Peter Spierenburg, G. Spinks, Claire Spottiswoode (University of Cambridge), Richard Ssemmanda, Michel St Jalme, Stefan Stadler (Frankfurt Zoological Gardens), Caroline Stahala, Jean-Claud Stahl (National Museum of New Zealand), Malcolm Starkey (BirdLife International), A. Start, Karel Stastny (Czech Society for Ornithology), Alison Stattersfield (BirdLife International), H Stehn, R. A. Stehn, Tom Stehn (US Fish & Wildlife Service), Antje Steinfurth, Iain Stenhouse (Alaska Audubon Society), Brent Stephenson (Wrybill Birding Tours), J Sterling, Paul Sterry, P. Stevenson, Terry Stevenson, David Stewart (Environmental Protection Agency, Queensland Gov.), Eric Stiles (New Jersey Audubon Society), F. Gary Stiles (Universidad Nacional de Colombia), Ilse Storch (IUCN/SSC/BirdLife/WPA Grouse Specialist Group), Stoycho Stoychev, Emilian Stoynov (Fund for Wild Flora and Fauna, Bulgaria), Stuart D. Strahl (Chicago Zoological Society), Robert Straub, F. C Straube, Maris Strazds (Latvijas Ornitologijas Biedriba), Ralf Strewe (Alianza para Ecosistemas Críticos), Hallvard Strom (Norwegian Polar Institute), N Stronach, David Stroud, Simon Stuart (Conservation International), T. E. H Stuart, Tom Stuart (BirdLife International), A Studer, Poorneshwor Subedi, S. Subramanya (Indian Birds), Ben Sullivan (BirdLife International Global Seabird Programme), Elchin Sultanov (Azerbaijan Ornithological Society), R Summers, Gopi Sundar (International Crane Foundation), Rob Suryan (Oregon State University), C. Susanth, Ann Sutton, Jens Otto Svendsen, T. V. Sviridova (Russian Bird Conservation Union), Paul Sweet (American Museum of Natural History), Kirsty Swinnerton (US Fish & Wildlife Service), R. Switzer, Andy Symes (BirdLife International), Evgeny Syroechkovskiy, Per Ole Syvertsen (University of Oslo), Michael Szabo (Forest and Bird), Zoltán Szabó, Tamas Szekely (University of Bath), Blas Tabaranza, Mehmet Ali Tabur (Süleyman Demirel University), Elisa Tack (Charles Sturt University), Hiraoka Takashi, Philip Tanimoto (University of Arkansas), Kate Tanner (Royal Society for the Protection of Birds), Warwick Tarboton (BirdLife South Africa), Vikash Tatayah (Mauritian Wildlife Foundation), Jose Tavares (Royal Society for the Protection of Birds), Graeme A. Taylor (Department of Conservation), Joe Taylor (BirdLife International), P. Barry Taylor (University of Natal), Tom Telfer (Hawaii Division of Forestry and Wildlife), Lorena Téllez García (Universidad Michoacana de San Nicolas de Hidalgo), Marcus Tellkamp, A. Tello, Helen Temple (BirdLife International), A. J. D. Tennyson, Joaquim Teodósio (Sociedade Portuguesa para o Estudo das Aves), Carol Terry (Hawaiian Department of Land and Natural Resources), Bernie Tershay (Island Conservation), Rod Tether, Leon Theron (Endangered Wildlife Trust), Jorn Theuerkauf (Conservation Research New Caledonia), Jean-Claude Thibault (Parc Naturel Régional de Corse), Jean-Marc Thiollay, David Thomas (BirdLife International), Richard Thomas (BirdLife International), Hazell Shokellu Thompson (BirdLife International), M. Thompson, Paul Thompson (Flood Hazard Research Centre), Simon Thomsett (The Peregrine Fund), Russell Thorstrom (The Peregrine Fund), Ralph Tiedemann (University of Potsdam), Rob Timmins, Ruth Tingay (Nottingham University), Boris Tinoco (Corporación Parque Nacional Cajas), . Tipamaa, Anna Tira (University of Queensland), Jugal Tiwara, Joe Tobias (BirdLife International), Mick Todd (University of Tasmania), Pavel Tomkovich, W. D. Toone, Jack Tordoff (BirdLife International), J. C. Torres-Mura, Stephen Totterman, Anders P. Tøttrup (Zoological

Museum, University of Copenhagen), Pierre Tourret (Ligue Pour La Protection des Oiseaux), Le Trong Trai, Colin Trainor (BirdLife International Asia Division), Nguyen Tran Vy (Institute of Ecology, Resources & Environ. Studies), Bernard Trolliet (ONFC), Francois Tron (A Rocha), D. M. Tully, Ann Turner (Mabula Ground Hornbill Conservation Project), Donald Turner (East African Natural History Society), Alan Tye, Stephanie Tyler (BirdLife Botswana), Chris Tzaros (Birds Australia), Mauricio Ugarte-Lewis, Les Underhill (University of Cape Town), L. Urbanek, D Uribe, Kimberly Uyehara (University of California, Davis), Sandra Valderrama (University of Waikato), René Valdés-Peña (Inst. Tecnológico de Estudios Sup. de Monterrey), Enrique Valdez, Mariana Vale (Duke University), Jaime Valenzuela, P. M. Valenzuela, T. Valqui (Gran Peru Bird Tours), Bas (S.) van Balen (Conservation International), M van Beirs, Arend van Dijk (SOVON Vogelonderzoek Nederland), . van Gausig, Jack van Hal (Department of Conservation), J. R. van Oosten, Merlijn van Weerd, Anthony Van Zyl, Jean Pierre Vande Weghe, J Vander Gaast, Eric VanderWerf (Pacific Rim Conservation), Kevin Vang, Hernan Vargas (Charles Darwin Research Station), Pedro Vaz Pinto (Universidade Católica de Angola), E. Velarde, Jorge Velásquez, M Velásquez, Myriam Velazquez, Metodija Velevski, Svetoslav Velkov (Balkani Wildlife Society), W-P Vellinga, A. C Venturini, Ludovic Verfaillie (Association pour la Sauvegarde de la Perruche d'Ou), E. Verlarde, Lalitha Vijayan, Robin Vijayan, F.J. Vilella (US Fish & Wildlife Service), Yerko A. Vilina (Unión de Ornitólogos de Chile), P. Villard, A. Viloria, Alexandre Vintchevski (BirdLife International - European Division), Javier Vinuela, C Violani, Munir Z. A. Virani (The Peregrine Fund), Jose Luis Vivero, Matthias Vögeli (Estación Biológica de Doñana, C.S.I.C.), A. Volkov, P. von Hildebrand, Luciana Wagner (University of Reading), John Waihuru, M. Wainstein, Bill Wakefield, K Wakelee, B. P. Walker, Barry Walker, Kath Walker (Department of Conservation), George Wallace (American Bird Conservancy), Bruno Walther (Centre of Excellence for Invasion Biology), Paul Walton (Royal Society for the Protection of Birds), Jie Wang (Chinese Academy of Sciences), Nan Wang (Beijing Forestry University), Q. Wang, Ross Wanless, Deepal Warakagoda, L. S. Warburton (University of KwaZulu-Natal), Ron Ward (Department of the Environment and Water Resources), Jim Wardill (Royal Society for the Conservation of Nature), Carolyn Wardle (Bahamas National Trust), Ben Warren (BirdLife International), Barry Watkins (Percy FitzPatrick Institute of African Ornithology), Doug Watkins (Wetlands International), Dick Watling (Environment Consultants Fiji), Brooke Watson (Dept for Environment and Heritage), Dave Watson (Charles Sturt University), Jim Watson (US Fish & Wildlife Service), Rick Watson (The Peregrine Fund), R.H. Wauer (Big Bend National Park, Texas), Susan Waugh (Forest and Bird), Keith Wearne (Coastal Environmental Trust of Namibia), H. P. Webb, R. Webster (Fieldguides Incorporated), Barry Weeber (Forest and Bird), David Wege (BirdLife International), Alexander Wegmann, Liang Wei (Hainan Normal University), Henri Weimerskirsch (Chizé Centre of Biological Studies (CNRS)), Geoff Welch (Royal Society for the Protection of Birds), H. J. Welch, David. R. Wells, Jeff Wells (Partners in Flight), Paul Wenninger (US Fish & Wildlife Service), David Westcott, Michael A. Weston (Deakin University), Karl Westphal, A. White, Graham White, Thomas White (Puerto Rican Parrot Recovery Program), Heather Whitlaw (Texas Parks and Wildlife Department), Bret Whitney (Louisiana State University), A Whittaker, D. Whitworth (Island Conservation), Peter Widmann, David Wiedenfeld (American Bird Conservancy),

G. Wiles, Roger Wilkinson (Chester Zoo), Ann Williams, Emmanuel T. C. Williams (International Crane Foundation), Jeff Williams (Alaska Maritime NWR), Martin Williams, Murray Williams (Department of Conservation), Rob Williams (BirdLife International), Robert Williams (Fundación Científica San Francisco), Sam Williams, David Willis, E. O. Willis, Angus Wilson, Duncan Wilson, J.R. Wilson, Jim Wilson (Georgia's Important Bird Areas Program), Kerry-Jayne Wilson (Lincoln University), Malcolm Wilson, Tony Wilson, Nurul Winarni (Wildlife Conservation Society), Ron Windingstad, Johanna Winkelmann (Vogelbescherming Nederland), William Wittkoff, Eric Woehler (Australian Antarctic Division), Fang Woei-Horng, John Woinarski (Natural Resources, Environment and The Arts, NT), Shaye Wolf (Center for Biological Diversity), James Wolstencroft, Kerri Wolter (Rhino & Lion Wildlife Conservation NPO), Mengistu Wondafrash (EWNHS), Pete Wood (BirdLife Indonesia), B. Woods, Robin W. Woods (Falklands Conservation), Bethany Woodworth (US Geological Survey), Friederike Woog (Staatliches Museum für Naturkunde Stuttgart), Lance Woolaver, G.E Woolfenden (University of South Florida), Simon Wotton (Royal Society for the Protection of Birds), G. Wragg, Hugh Wright (University of East Anglia), Micheal Wunder, Joseph Wunderle, Jose Xavier (British Antarctic Survey), Xing Lianlian, Carlos Yamashita, Liu Yang, Rafat Yasmeen (Ornithological Society of Pakistan), Yamada Yasuhiro, Dennis Yong (Kingfisher Tours), Ding Li Yong, P. M. Yorio (Wildlife Conservation Society), Glyn Young (Durrell Wildlife Conservation Trust), Jessica Young (Western State College), Lindsay Young (University of Hawai'i), Sadegh S Zadegan, Carlos Zavalaga, U Khin Maung Zaw (Nature & Wildlife Cons. Div., Forest Department), Sama Zefania (University of Antananarivo), Zhang Zhengwang (Beijing Normal University), Mark Ziembicki (University of Adelaide), K Zimmer, Christoph Zöckler (UNEP - WCMC), Jim Zook (Unión de Ornitólogos de Costa Rica), Thomas Züchner, Johana Zuluaga.