Extended Data Table 1 | Hypotheses and explanatory variables tested for explaining the patterns in waterbird abundance changes over space and species

Hypotheses	Drivers	Descriptions	Explanatory variables used	Data sources
Anthropogenic impacts	Surface water	Surface water provides an essential habitat for most wetland-dependent species[1], thus its decline can threaten the status of waterbirds	Mean changes (%) in surface water occurrence between 1984-1999 and 2000-2015, within 1km from each survey site	Global Surface Water[16]
	Economic growth	Economic growth poses a threat to species through habitat loss and degradation but can also improve environmental quality at a high economic level[57].	Mean country-level GDP per capita between 1990 and 2010	World Bank*
			Mean country-level GDP growth rate (annual %) between 1990 and 2010	World Bank†
	Human population growth	High species extinction risk is associated with high human population density[58] and rapid human population growth[59].	Mean changes in human population density between 1990 and 2000	Population Density Grid v3[60]
	Agricultural expansion	Farming is the biggest source of threats to bird species[61].	Changes in crop area (croplands and cropland/natural vegetation mosaics) between 2001 and 2010	Collection 5 MODIS Global Land Cover Type product[62]
	Climate change	Climate change is a strong predictor of bird abundance changes[63].	Changes in mean Dec-Feb temperature between 1985-1990 and 2005-2010	CRU TS3.10 Dataset[64]
			Changes in mean Dec-Feb precipitation between 1985-1990 and 2005-2010	CRU TS3.10 Dataset[64]
Conservation efforts and effectiveness	Protected areas	Waterbird abundance increased more rapidly in protected than in unprotected wetlands[65,66].	Proportion of sites covered by protected areas	World Database on Protected Areas[67]
	Governance	Ineffective governance in a country is associated with species population declines[17].	Mean of six country-level Worldwide Governance Indicators between 1996 and 2010	World Bank‡
Species characteristics	Geographical range size	Species with small geographical range may be more susceptible to large-scale, stochastic threats[68].	Breeding/resident geographical range size (km^2)	Birdlife Data Zone§
	Migratory status	Migratory species can be affected by conditions at multiple locations, thus tend to show population declines[69,70].	Migrant or non-migrant	Birdlife Data Zone§
	Body size	Body size is a strong predictor of bird abundance changes[71] but its association with bird extinction risk can be both positive and negative, depending on threats to the species[72]	Body mass (g)	EltonTraits 1.0[73]

*http://data.worldbank.org/indicator/NY.GDP.PCAP.KD.
†http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG.
‡http://data.worldbank.org/data-catalog/worldwide-governance-indicators.
§http://datazone.birdlife.org/home.