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A Global Index of Biocultural Diversity

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EXECUTIVE SUMMARY

Biocultural diversity (BCD) is the total variety exhibited by the world's natural and cultural systems. A basic premise of first-generation scholarship on BCD has been that the relationships between humans and the world's non-human species, and between them both and the landscapes they inhabit, do not run on parallel tracks. Rather, these relationships affect each other, in certain cases are closely linked, and sometimes may even be constitutive of each other in important ways. Among the challenges for the next wave of BCD scholarship will be to develop quantitative measurements of BCD.

The Index of Biocultural Diversity (IBCD) is a beginning step toward that goal. The IBCD measures the status of and trends in BCD on a country-by-country basis, based on five indicators: languages, religions, and ethnic groups (for cultural diversity), and bird/mammal species and plant species (for biological diversity). These indicators were selected because data are readily available for them.

The IBCD has three components:

- A *biocultural diversity richness component* (BCD-RICH), which is a relative measure of a country's "raw" BCD using unadjusted counts of the five indicators.
- An *areal component* (BCD-AREA), which adjusts the indicators for land area and therefore measures a country's BCD relative to its physical extent. This is important to measure because large countries are more likely to have higher biological diversity than small countries. Nevertheless, some small countries have biological diversity that is high relative to their area, just as some large countries have low biological diversity relative to their area. BCD-POP adjusts the rankings to account for these situations.
- A *population component* (BCD-POP), which adjusts the indicators for human population and therefore measures a country's biocultural diversity relative to its population size. This is important to measure because countries with high human populations are more likely to have higher cultural diversity than countries with small populations. Nevertheless, some countries with small populations have cultural diversity that is high relative to their population size; and, conversely, some countries with high populations have cultural diversity that is low relative to their population size. BCD-POP adjusts the rankings to account for these situations.

Biocultural diversity is not distributed evenly around the world. If one ranks countries according to the richness of any of the BCD indicators considered here, one gets a few very large values rapidly diminishing to many small values. This is a well-known statistical pattern, known as a logarithmic distribution, and applies equally well to the distribution of species, ethnic groups, and religions among countries. To adjust for this, we used a logarithmic scale to rank countries in the index, which results in a linear distribution of the index values.

Results are presented in an series of data tables and graphs. A key finding is that there are three “core regions” of BCD: the Amazon Basin, Central Africa, and Indomalaysia/Melanesia.

BACKGROUND

Conservation in concert

The relationships between biological and cultural diversity, and the growing threats they face in common, have drawn increasing attention over the last decade (e.g., Moore et al. 2002; Harmon 2002; Sutherland 2003). Building on pioneering scholarship in ethnobiology, ethnobotany, and related fields, the concept of *biocultural diversity* has taken hold (Maffi 2001) and is being spotlighted more and more. Conservationists, among others, have begun to take the idea on board. This is in line with a two-decade-long trend toward more receptivity to accounting for the needs of people in nature conservation schemes. While by no means universal, this attitude is now a firm part of conservation debates. It is now not unusual to read prominent (though often rather superficial) declarations of the importance of preserving biological *and* cultural diversity as a central conservation goal. Concerns about these dual realms of diversity have found their way into major international conservation communiqués (e.g., the Durban Accord of the 2003 World Parks Congress) and are enshrined in capstone international instruments, such as the Convention on Biological Diversity.

What is biocultural diversity?

Biocultural diversity (BCD) is the total variety exhibited by the world's natural and cultural systems. It may be thought of as the sum total of the world's differences, no matter what their origin. It includes biological diversity at all its levels, from genes to populations to species to ecosystems; cultural diversity in all its manifestations (including linguistic diversity), ranging from individual ideas to entire cultures (see Hunn 2001, 121); the abiotic or geophysical diversity of the earth, including that of its landforms and geological processes, meteorology, and all other inorganic components and processes (e.g., chemical regimes) that provide the setting for life; and, importantly, the interactions among all of these.

A basic premise of first-generation scholarship on BCD has been that the relationships between humans and the world's non-human species, and between them both and the landscapes they inhabit, do not run on parallel tracks. Rather, these relationships affect each other, in certain cases are closely linked, and sometimes may even be constitutive of each other in important ways. Much of this first-wave scholarship has aimed to establish correlations between biological and cultural/linguistic diversity in terms of (1) geography (e.g., areas of overlap), (2) theory (e.g., how language may be related to long-term environmental management in indigenous communities), and (3) common threats to their continuation. Among the challenges for the next wave of BCD scholars will be to see if the relationships go deeper than mere correlations to something approaching actual coevolution, to elucidate the complexities of how humans and non-human species interact not only with one another but also with abiotic diversity (e.g., through the formation of cultural landscapes), and to deepen the theoretical foundations of BCD research. In all of these aims it would be useful to have baseline data.

The Index of Biocultural Diversity: overview

The Index of Biocultural Diversity (IBCD) is a first step toward developing such data. The IBCD is being developed under the auspices of Terralingua, an international nongovernmental organization that works on several fronts to assess the world's BCD. The assumption underlying Terralingua's work is that the state of the world's BCD is threatened with serious decline.

In brief, the IBCD uses a combination of indicators of BCD to establish rankings for 238 countries and territories. There are five indicators:

- the number of (1) languages, (2) religions, and (3) ethnic groups present within each country as a proxy for its cultural diversity; and
- the number of (4) bird and mammal species (combined) and the number of (5) plant species as a proxy of its biological diversity.

The IBCD has three parts, each of which analyzes these indicators in a complementary way:

- A *biocultural diversity richness component* (BCD-RICH), which is a relative measure of a country's "raw" BCD using unadjusted counts of the five indicators.
- An *areal component* (BCD-AREA), which adjusts the indicators for land area and therefore measures a country's BCD relative to its physical extent. This is important to measure because large countries are more likely to have higher biological diversity than small countries. Nevertheless, some small countries have biological diversity that is high relative to their area, just as some large countries have low biological diversity relative to their area. BCD-POP adjusts the rankings to account for these situations.
- A *population component* (BCD-POP), which adjusts the indicators for human population and therefore measures a country's biocultural diversity relative to its population size. This is important to measure because countries with high human populations are more likely to have higher cultural diversity than countries with small populations. Nevertheless, some countries with small populations have cultural diversity that is high relative to their population size; and, conversely, some countries with high populations have cultural diversity that is low relative to their population size. BCD-POP adjusts the rankings to account for these situations.

BCD-RICH is the most straightforward measure of biocultural diversity, but BCD-AREA and BCD-POP are equally important components of the IBCD because they highlight countries that are small in area and/or population size but which have relatively high biocultural diversity (or vice versa). In effect, they broaden the analysis beyond mere counts of cultural groups and species. As we shall see, there are only a handful of countries that rank highly in all three components.

The IBCD measures the status of and trends in BCD on a country-by-country basis.[1] Organizing the IBCD this way is not ideal from an ecological and ecolinguistic point of

[1] "Country" in this paper should be understood as referring to any political division that is either (a) generally recognized (e.g., through membership in the U.N.) as an independent state, (b) a non-contiguous dependency of an independent state, or (3) a territorial entity

view, since species, cultures, and languages usually do not respect national borders. In addition, changes in national boundaries (such as followed the dissolution of the Soviet Union, or the division of Eritrea and Ethiopia, to take two recent examples) can wreak havoc on trying to establish meaningful time-series data sets. However, most of the global data relevant to the IBCD is organized on a country-level basis, and all global indices are organized this way.

Purpose of the IBCD

The purpose of any index, including the IBCD, is to gauge current conditions and trends in a particular subject of study—in this case, the world's BCD. An index is not an in-depth analysis. Rather, using a small number of *indicators* (variables thought to be representative of current conditions and trends) the index "points the way" toward a *general* understanding of what is happening to the subject. A well-constructed index will also give a sense of where the gaps in knowledge are.

Limitations of the IBCD

Data availability is the ultimate limiting factor for any index. All global environmental and cultural indices are based on datasets that are incomplete or of uneven quality, and possibly out of date as well. There is no widely followed standard for gathering the kinds of data that could indicate the global status of BCD—as opposed to economic or human health data, such as those that form the basis for calculations of Gross National Product or the U.N. Development Program's widely cited Human Development Index (HDI).

The basic building blocks of data needed to fully determine the global status of BCD are not presently available. Such data would largely have to derive from national censuses (for cultural data) and comprehensive ecosystem inventories (for biological and geophysical data). The obstacles to obtaining these data on a global scale are formidable, to say the least. Not only is there no coordination across countries of the format and timing of censuses, but even if there were there are numerous pitfalls in administering censuses that can bias the results and confound the proper interpretation of respondents' answers (for a Canadian example, see Mackey and Cartwright 1979, 69-80). Nor is it likely that many countries can mount the kind of detailed scientific inventory needed to fully catalogue their biological and geophysical resources.

This is not an unusual situation. All global-level indices rely on simple proxies to measure complex characteristics. For example, the HDI boils down the enormously complicated factors that determine human well-being into three simple metrics: a long and healthy life (as measured by life expectancy), the attainment of knowledge (as measured by school enrollment), and enjoyment of a decent standard of living (as measured by per capita Gross Domestic Product). By definition, the use of proxies oversimplifies the picture.

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whose political/civil status is in dispute. The authors intend no judgment whatsoever about the status of any disputed territory, and the inclusion or exclusion of a particular entity in the data tables or the text should not be taken as such a judgment.

Despite these problems and limitations, global indices are recognized as valuable sources of information because they offer first-cut guidance about large-scale trends, using the best data available to us now. The authors fully recognize that a complete understanding of BCD can only be attained by analyzing it at *all* scales, from local on up to international. Obviously, in many countries BCD varies widely from place to place, and this variation will not be apparent at the national-level scale on which the IBCD operates. Such within-country variations are important; thus, like any other global index, the IBCD should not be seen as a substitute for fine-grained studies of local or other subnational conditions. However, it may be possible to apply the IBCD methodology to subnational areas in order to produce nested levels of analysis.

Indicators of BCD

In broadest terms, there are two types of indicators that can be used to make an index of BCD:

- *Current-state indicators*. These are simple indicators of the existing BCD within a country; e.g., the number of species, the number of languages, the number of religions, etc. Expressed as per capita measures, or per unit of area, they can provide a sense of the "biocultural density" of a country. For example, it is possible to express the linguistic diversity of a country in terms of the total number of languages spoken, or the number of languages spoken per capita (languages divided by population), or the number of languages spoken per square kilometer (languages divided by area). Each of these three measures would express different perspectives of the linguistic diversity of that country.
- *Direction-of-change (trend) indicators*. For many indicators of biological and cultural diversity, such time-series data as are available are far from precise. Indicators based on these data can provide information on the general direction of change in the element under consideration, but should not be used to generate rankings of countries that would lead the reader to believe that the rankings are based on data that allow precise gradations among countries. This type of indicator may be thought of as a stand-alone measurement of whether the BCD in a given country is declining, stable, or increasing.

In terms of specific BCD indicators, a few of the many possible indicators of cultural diversity include:

- Language richness (i.e., number of languages, dialects, pidgins, creoles, ceremonial languages, deaf languages, linguae franchae)
- Language endemicity
- Language demographics (i.e., intergenerational transmission data, UNESCO threat status)
- Intra-language structure (functional domains, discourse, syntax, morphology, lexicon, phonology)
- Social structure
- Ethnicity and ethnolinguistic fractionalization
- Traditional (environmental) knowledge

- Religion and spiritual belief (recognizing that for some groups this transcends culture)
- Artistic expression and allied areas (e.g., performing arts, literature, clothing and personal adornment, etc.)
- Methods of food production and cultural patterns of consumption (crop and livestock selection; agricultural, pastoral, hunting, and gathering techniques; diet)

An in-depth discussion of these cultural diversity indicators is outside the purposes of this paper. Here, it is enough to note that existing global-level indices of human well-being have almost completely ignored them, some consciously because of a perceived lack of data (e.g., Prescott-Allen 2001) but most silently, without giving a reason. One of the aims of the IBCD is to fill this gap.

For biological diversity, some of the possible indicators include:

- Species richness and population numbers
- Area and quality of natural habitat
- Genetic variety of subspecies or breeds
- Threat status of species (e.g., IUCN Red List status)
- Extent of nature reserves and protected areas

Species richness is the most frequently used measure of biodiversity: it is easily quantified, data exist, and it captures the essence of biodiversity. The species is the basic unit of biodiversity, and species extinction is the most basic expression of biodiversity loss (Gaston 1996). The other components of biodiversity—ecosystem diversity and genetic diversity—are far more difficult to measure. Measures relating to habitats or ecosystems are complex because, firstly, there is no internationally accepted classification of ecosystem types as there is for species, and secondly, apart from forest cover, data on habitat area are very patchy and not available for many parts of the world (and data on habitat quality are almost non-existent). Genetic diversity is difficult to quantify and measure for even a single species, let alone an entire biotic community.

What makes an indicator a feasible choice for a global index such as the IBCD?

1. There must be a worldwide dataset for the proposed indicator, or a reasonable likelihood that global data could be developed for it from existing sources of information.
2. There must be a way of quantifying the indicator's dataset.
3. The proposed indicator must have theoretical significance, be capable of being mapped, and be capable of being tracked over time.

Scoring and weighting of indicators

Two fundamental decisions facing the developers of any index are (1) how to score the indicators and (2) whether to assign components of the index different weighted values or leave them unweighted.

Any number of scoring methods is possible. We chose a 0–1 scale to match that of several of the most widely used indices, such as the HDI, various ethnolinguistic fractionalization indices, and the Greenberg A Index of linguistic diversity. (For an extended discussion of Greenberg's and similar indices, and their relevance to the IBCD, see the Appendix.)

Another decision that presents itself is whether to weight indicators. Weighting is simply a way of changing the calculation method based on the considered judgment of the index compilers. For instance, in a weighted index the value for a particular factor that is considered preponderantly important by the compilers might be assigned a two-thirds weight in the overall calculation, with a second and third factor each getting a one-sixth weight. In an unweighted index, all three of these factors would get an equal weight (i.e., each would count one-third toward the overall calculation). Although weighting methods can be useful in situations where data are abundant and basic knowledge is settled so that only the significance of details is in dispute, in other cases weighting boils down to a more-or-less arbitrary judgment of the compilers. Because the state of BCD is just beginning to be analyzed, we have left all the indicators unweighted in the IBCD.

Measuring diversity: some technical and theoretical considerations

When measuring diversity, it immediately becomes apparent that the objects of measurement—i.e., the components of diversity, whether they be species, languages, ethnic groups, or whatever—are not distributed evenly. Studies typically uncover a lot of information about widely distributed, common, or numerically large components within a given class, yet overall diversity is usually determined by the presence of many narrowly distributed, uncommon, and numerically small components. For example, an all-taxa biodiversity inventory of Great Smoky Mountains National Park (USA) has uncovered a number of small, rare microhabitats (such as waterfall spray zones, high-elevation cliff seeps) that are hard to inventory and so are not well known. Researchers in the park believe that "a substantial fraction of this landscape's 'biodiversity' may be tied to habitats that are small and often subsumed into larger habitat categories" (Langdon 2002, 5). More generally, in sampling species richness "we often find we have the most information where it is the least useful. That is, a few classes account for most of the observations, whereas a few observations are scattered over most of the classes" (Leitner and Turner 2001, 4:124). The same considerations, the authors add, apply beyond the bounds of biology.

The distribution of the world's languages provides an excellent illustration of this. When classed according to the number of mother-tongue speakers per language, the distribution is radically skewed toward the dozen or so largest languages. These languages are spoken by more than 95% of the world's people, yet they represent far fewer than 1% of the world's 6,800+ languages (Harmon 1995; Harmon 2002). So most of the world's linguistic diversity, as measured by the proxy of language richness, is found in very small endemic languages that, like small rare habitats, tend to be lumped into larger categories (such as being listed under the generic category "native languages" or "other small languages' in country-level reference works aimed at non-specialists) where their individuality is lost. Nevertheless, most of the information we have about languages is derived from the largest, most widely distributed ones—precisely the phenomenon described above.[2] As we shall see, this has important ramifications for the construction of the cultural diversity component of the IBCD.

These considerations bring forth a fundamental question: when we talk about measuring diversity, just what do we mean? There are two basic ways to gauge diversity:

1. Calculate the raw *richness* of the components of diversity being measured. This simply means figuring out the raw number of discrete components present through some kind of survey (or, failing that, applying an estimation model). In the case of the IBCD, these components are languages, religions, and ethnic groups (for cultural diversity) and bird/mammal and plant species (for biological diversity).
2. Calculate the *distribution* of the components of diversity being measured, taking into account the relative abundance of each one (species, language, etc). Because calculating a distribution depends on richness data, we can consider richness to be the fundamental measure of diversity. And, in fact, most measures of diversity, whether biological or cultural, rely on richness data (Leitner and Turner 2001, 4:124; Harmon 2002).

The index presented here is based on richness data only. A more sophisticated analysis would take abundance distributions into consideration, but the lack of data on relative abundance of species, language speakers, etc., precludes this possibility at present.

[2] The search for language universals, which has largely focused on investigation of a very small number of Indo-European languages, is a case in point.

METHODS

Overview

Again, the three components of the IBCD (BCD-RICH, BCD-AREA, and BCD-POP) are derived from five indicators of BCD:

- number of languages
- number of ethnic groups
- number of religions
- number of bird and mammal species (combined0
- number of plant species

Each of the three parts of the IBCD gives equal weight to cultural and biological diversity. For example, a country's overall BCD-RICH score is calculated as the average of its cultural diversity richness score (aggregated from the scores for languages, religions, and ethnic groups) and its biological diversity richness score (aggregated from the scores for bird/mammal species and plant species). The same holds true for BCD-AREA and BCD-POP.

When values for these indicators are ranked on a global basis, it becomes apparent that biocultural diversity is not evenly distributed. A few countries are megadiverse, with very large values; then the ranking rapidly diminishes to much lower values found in more typical countries. Because this makes comparisons among countries difficult, we used a common log scale to produce a linear distribution.

For example, the language indicator index for BCD-RICH is calculated as the log of the number of languages spoken in a country divided by the log of the number of languages spoken worldwide. The process was repeated for the other four indicators to derive BCD-RICH.

As noted above, to compensate for the fact that large countries tend to have a greater biological and cultural diversity than small ones simply because of their greater area (or greater population), we calculated two additional diversity values for each country by adjusting first for land area (BCD-AREA) and second for population size (BCD-POP). This was done by measuring how much more or less diverse a country is in comparison with an expected value based on its area or population alone. The method used is a modified version of that used by Groombridge and Jenkins (2002). The process was repeated for the other four indicators to derive BCD-AREA and BCD-POP.

The expected diversity was calculated using the standard formula for the species–area relationship $log\ S = c + z\ log\ A$ where S = number of species, A = area, and c and z are constants derived from observation. Because the distributions of the five indicators against land area and population size are similar, we applied the same formula to indicators of cultural diversity. Hence, for BCD-AREA *expected* $log\ N_i = c + z\ log\ Ai$ where N_i = number of languages, religions, ethnic groups, or species in country i, and A_i = area of country i. The same formula was used for BCD-POP, except that P_i (population of country i) replaces A_i. To find the values of the constants c and z for each of the indicators, we scatter-plotted log N_i (where N_i = number of languages, religions, ethnic groups, or species in country i) against log A_i for all countries, and drew the best-fit straight line through the points.

To calculate the deviation of each country from its expected value, we subtracted the expected log N_i value from the observed log N_i value. The index is calibrated such that the world, or maximum, value is set equal to 1.0, the minimum value is set equal to zero and the average or typical value is 0.5 (meaning no more or less diverse than expected given a country's area or population).

Next, we describe the data sources of the indicators and relevant caveats to the data.

Cultural diversity indicators

Number of languages. Language data are derived from the 2000 edition of *Ethnologue,* the standard reference list of the world's languages (Grimes 2000). Other global language compilations are either outdated (e.g., Meillet and Cohen 1924, Meillet and Cohen 1952, Voegelin and Voegelin 1977), only treat the world's larger languages (e.g., Comrie 1987), or else utilize a classification system that is not widely accepted by professional linguists, at least as of yet (e.g., the Linguasphere database, published in Barrett et al. 2001).

Ethnologue is a country-by-country listing of languages. There are well over 7,000 entries in the 2000 edition, representing 6,809 unique languages, both living and extinct. Each entry gives a main name for the language; a unique three-letter code to distinguish languages with identical or similar names; alternative names by which the language was or may still be known, whether in the local vernacular or the professional linguistic literature (with derogatory names flagged); the number of mother-tongue speakers, if known; the names of other countries in which the language is spoken, if any; known dialects; linguistic information, such as language family affiliation, linguistic typology, the availability of dictionaries and grammars; ecological information on the environment and subsistence type of the speakers (for some languages); and, because the publishers are a Christian missionary organization, information of the availability of the Bible in the language. *Ethnologue* includes information on deaf sign languages, non-deaf sign languages, pidgins and creoles, a few widely used artificial languages (e.g., Esperanto), ritual and auxiliary languages that do not have mother-tongue speakers, and many recently extinct languages. *Ethnologue* also includes qualitative information about language endangerment. For example, an entry may contain statements to the effect that children are no longer learning the language, or that all fluent speakers are over 50 years old, or that the language has so few mother-tongue speakers left that it is "nearly extinct." (For further discussion of matters related to interpreting *Ethnologue* data, see Harmon 1995.)

The languages listed under each country heading in *Ethnologue* are either endemic languages confined to that country alone, or other, non-endemic languages that the editors consider of sufficient linguistic, political, or social interest to warrant an individual entry under that country. For example, the main entry for English is under the

United Kingdom. Other, abbreviated entries for English, usually containing information pertinent to the country (such as dialects spoken there) are found for many other countries in which English is spoken, with cross-references to the main U.K. entry. In addition to the individual language entries under each country heading, there is an introductory paragraph for the country which includes (where applicable) a list of immigrant languages spoken there. Only those immigrant languages that are still spoken in the country of origin and that do not display significant dialect differences with the original form are listed in this introductory paragraph. The editors caution that, for many countries, the list is incomplete and in certain cases may be incorrect. Nonetheless, we tallied the number of languages listed in the introductory paragraph and added it to the number of languages listed individually under the country's entry to arrive at a total number of languages spoken in each country. Because the introductory list of immigrant languages is often incomplete, the total number of languages reported here for each country may be an undercount of the true number. This undercount is probably quite significant for countries with large immigrant populations, such as the USA, where the *Ethnologue* introductory list is certainly incomplete. On the other hand, for smaller countries with less diverse immigrant populations, the number of languages reported here may be accurate or only a slight undercount.

Number of religions. Data on religions are from the *World Christian Encyclopedia,* second edition (Barrett et al. 2001), a widely cited source for the numbers of religions, denominations, and adherents worldwide. The authors define "religion" as "a grouping of persons with beliefs about God or gods, and defined by its adherents' loyalty to it, by their acceptance of it as unique and superior to all other religions, and by its relative autonomy" (Barrett et al. 2001, 1:29). The compilers of *World Christian Encyclopedia* have tracked information on 19 major religions and related religious categories (such as "nonreligious" and "atheist") for more than 20 years (cf. the first edition, Barrett 1982) and have time-series data going back to 1900 (on a global level).

Number of ethnic groups. Data on ethnic groups are also taken from the *World Christian Encyclopedia,* second edition (Barrett et al. 2001), primarily because it gives detailed breakdowns for over 200 countries. The authors continue a classification system published in the first edition of the *Encyclopedia* (Barrett 1982). In this system, the world's peoples are divided into 432 primary ethnolinguistic groups, each with an identifying code. These codes are then applied to different groups at the national level to produce 12,583 distinct ethnic groups;[3] population numbers for each of these groups are given and form the backbone of the *Encyclopedia's* ethnolinguistic analysis.

[3] It might be more accurate to refer to them as "ethnopolitical groups," since the 432 basic categories are used over and over again so that, at least in some instances, the only distinction being drawn is over which country the group lives in. For example, category CLT27, Latin-American White (Blanco)—i.e., a Spanish-speaking Latin American of European descent—appears in all Spanish-speaking Latin American countries, making for numerous "ethnic groups." However, it is debatable whether (for example) a "CLT27" in Chile is truly ethnically distinct from a "CLT27" in Argentina.

Biological diversity indicators

Number of bird/mammal species; number of plant species. Data on bird/mammal species richness, on and plant species richness—the two indicators of biological diversity used for the IBCD—are taken from *Global Biodiversity: Earth's Living Resources in the 21st Century* (Groombridge and Jenkins 2002). It lists the total numbers of bird, mammals and plant species recorded in each country, as well as the number of endemic and threatened species in each of these three groups. Marine species are excluded. The total for birds includes only those species which are known to breed in a particular country, and not the total number recorded, which would include a number of non-breeding migrant and vagrant species and so inflate the species richness. Birds and mammals, but not reptiles, amphibians, fish or invertebrates, are used to represent the entire animal kingdom because only these two taxonomic groups have been extensively surveyed and recorded in most countries. The other groups are less well studied, and the numbers recorded in many countries are liable to change. However, any species richness data should be regarded as being provisional, as the totals tend to change over time with new surveys or changes to taxonomic classification. The number of plant species recorded in a country is likely to change more than the number of bird and mammal species, particularly in tropical countries, but plants are included here to give a more balanced picture of biodiversity than would be given by looking at birds and mammals alone. Currently, 9,946 bird species, 4,763 mammal species and 250,876 plant species have been recorded worldwide.

Calculating the IBCD components

The IBCD gives equal weight to cultural and biological diversity. A country's IBCD value therefore is calculated as the average of its cultural diversity (CD) and its biodiversity (BD), or:

$$IBCD = (CD + BD)/2$$

In measuring a country's cultural diversity (CD), equal weight is given to linguistic, religious, and ethnic diversity. Therefore CD is calculated as the average of a country's language diversity (LD), religion diversity (RD), and ethnic group diversity (ED):

$$CD = (LD + RD + ED)/3$$

In measuring biodiversity (BD), equal weight is given to animal species diversity (using birds and mammals as a proxy for all animal species) and plant species diversity. Therefore BD is calculated as the average of a country's bird and mammal species diversity (MD), and plant species diversity (PD):

$$BD = (MD + PD)/2$$

To calculate CD and BD, we first took the logarithms of the richness values for each indicator in each country. For example, the number of languages (L) spoken in Afghanistan is 49; log L = 1.69.

We used logarithms because BCD—whether measured using species, languages, ethnic groups, or religions—is not distributed evenly around the world. If one ranks countries according to the richness of any of the BCD indicators considered here, one gets a few very large values recorded in the world's megadiverse countries, rapidly diminishing to lower values found in more typical countries. For example, 833 of the world's 6,800 languages (12%) are spoken in just one country, Papua New Guinea. The average number of languages spoken in the 229 countries and territories for which we have data is 45, Mali being an average country in this respect. But only in a minority of the world's countries (50) are there 45 or more languages spoken, whereas in the majority of countries (179) there are fewer than 45 languages spoken. In almost half of those countries (85) there are fewer than 10 languages spoken. In other words, a few countries hold a disproportionately large share of the world's linguistic diversity . This is a well-known statistical pattern, known as a logarithmic distribution, and applies equally well to the distribution of species, ethnic groups, and religions among countries. To adjust for this, we used a logarithmic scale, the common log scale, to rank countries in the index. This results in a linear distribution of the index values.[4]

Applying a common log scale essentially compresses a large range of values down to a manageable range. For example, as we noted above, the maximum number of languages spoken in one country is 833, the average number of languages spoken is 45, while several countries share the minimum value of 1 language only. Taking the common logs of these three numbers (log 833 = 2.92; log 45 = 1.65; log 1 = 0) gives us a scale of 2.92 to 0 instead of 833 to 1 (see examples in the table below). Because the common log scale smoothes out the skewed distribution into a linear distribution, the values, when compared with one another, fall into a much more even (linear) pattern.

Representative Log L values

Country/Territory	**No. languages spoken (L)**	**Log L**	**Language Diversity index LD-RICH ($\log L_i/\log L_{world}$)**
World	6,800	3.83	1.000
Papua New Guinea (highest)	833	2.92	0.762
Mali (average)	45	1.65	0.431
Bermuda (lowest)	1	0.00	0.000

Calculating IBCD-RICH. To generate the raw richness component of the index (IBCD-RICH), we compared each country's value with the global richness value. For example, staying with language diversity, the index is calculated as the log of the number of languages spoken in a country divided by the log of the number of languages spoken

[4] The log is the exponent that indicates the power to which a base number must be raised to produce a given number. For index work, where a linear progression of logs is wanted, *common logarithms* (logs to base 10) are used. Hence, log 1 = 0 ($10^0 = 1$), log 10 = 1 ($10^1 = 10$) log 100 = 2 ($10^2 = 100$), log 1,000 = 3 ($10^3 = 1{,}000$), and so on.

worldwide. The total number of languages currently spoken is 6,800 (log 6,800 = 3.83). Hence the formula we used is:

$$XX\text{-}RICH = \log N_i / \log N_{world}.$$

where XX = LD, RD, ED, MD, or PD;
N_i = number of languages, religions, ethnic groups, or species in country i;
N_{world} = the actual observed number of languages, religions, ethnic groups, or species in the world);

Calculating IBCD-AREA. To compensate for the fact that large countries tend to have a greater cultural and biological diversity than small ones simply because of their greater area, a second component of the IBCD adjusts the BCD value for each country by accounting for its land area. This was done by calculating how much more or less diverse a country is in comparison with an expected value based on its area alone. For example, if they were typical for their respective land areas, one would expect about 36 or 37 languages to be spoken in Papua New Guinea and about 50 languages to be spoken in Mali. Therefore, based on their areas, Papua New Guinea is vastly more diverse than one would expect, whereas Mali is slightly less diverse than one would expect. The method is a modified version of that used by Groombridge and Jenkins (2002).

The expected diversity of a country is derived from the species-area relationship, which comes from ecological theory:

$$\log S = c + z \log A$$

where S = number of species;
A = area; and
c and z are constants.

The formula simply states that the log of the number of species present in a country or territory increases in proportion with the log of the area of the country or territory. The constants c and z can be derived by observation. We have applied the same formula to indicators of cultural diversity, hence:

$$\text{expected} \log N_i = c + z \log A_i$$

where N_i = number of languages, religions, ethnic groups, or species in country i;
A_i = area of country i: and
c and z are constants.

Strictly speaking, the species-area formula applies only to biodiversity. However, we used it to make area adjustments for the cultural indicators because, as noted above, the global distribution patterns of richness in cultural diversity and biodiversity are similar.

To find the values of c and z for each of the indicators used in the IBCD-AREA analysis, we scatter-plotted log N_i against log A_i for all countries, and drew the best-fit straight line through the scatter; z is the slope of the line and c is the point where it intersects the y-axis. To calculate the deviation of each country from its expected value we simply subtracted the expected log N_i value from the observed log N_i value.

$$\text{Deviation from expected value} = \log N_i - \text{expected} \log N_i$$
$$\text{or } \log N_i - (c + z \log A_i)$$

This gives a series of values for each country where a score of 0 means that the country is exactly as diverse as one would expect based on its area, a score of 1 means it is ten times more diverse, a score of 2 means it is a hundred times more diverse, a score of -1 means it is ten times less diverse, a score of -2 a hundred times less, and so on.

The index is calculated such that the global value is equal to 1.0 and the minimum value is zero. The global value for each of the five measures is also the maximum value, or, put another way, the world as a whole is more diverse than any country, even after adjusting for land area. The minimum value was selected by choosing a value below that of the any country. Hence the formula used to calculate a country's area-adjusted diversity value for each of the five indicators was:

$$\text{XX-AREA} = \frac{D_i - D_{min}}{D_{max} - D_{min}}$$

where

D_i = observed log N_i – expected log N_i;
D_{min} = a value below that of the least diverse country; and
$D_{max} = D_{world}$, the actual observed value for the entire world.

Examples of IBCD-AREA methodology using language diversity data

Country	**Area (A) [thousand km²]**	**Log A**	**No. languages spoken (L)**	**Log L**	**Expected log L value**	**Deviation from expected value (D)**	**Language diversity index LD-AREA**
World	136,605	8.14	6,800	3.83	2.33	1.50	1.000
PNG	463	5.67	833	2.92	1.56	1.36	0.954
Turkmenistan	488	5.69	37	1.57	1.57	0.00	0.525
Greenland	2,176	6.34	2	0.30	1.77	-1.47	0.062
Minimum value	1,000	6.00	1	0.00	1.67	-1.67	0.000

Calculating IBCD-POP. Finally, a third component of the index, IBCD-POP, compensates for the fact that more populous countries tend to have greater cultural diversity than small ones because of greater population size. This was done in the same way as compensating for area, by calculating deviation from an expected value based on population size alone, using the formula:

$$\text{expected } \log N_i = c + z \log P_i$$

where N_i = number of languages, religions, ethnic groups or species in country i;
P_i = population of country i: and
c and z are constants.

To calculate c and z, we scatter-plotted log N_i against log P_i for all countries, and added the best-fit straight line; z is the slope of the line and c is the point where it intersects the y-axis. To calculate the deviation from the expected value we simply subtracted the expected log N_i value from the observed log N_i value.

The formula used to calculate a country's population-adjusted value for each of the five indicators was the same as that used to calculate the area-adjusted value:

$$\text{XX-POP} = \frac{D_i - D_{min}}{D_{max} - D_{min}}$$

where
D_i = observed log N_i – expected log N_i;
D_{min} = a value below that of the least diverse country; and
$D_{max} = D_{world}$, the actual observed value for the entire world.

However, unlike IBCD-AREA, for some component indicators the value of D_{max} in IBCD-POP was not equal to D_{world}, and so an arbitrary maximum value was chosen at a level greater than that of the most diverse country.

Examples of IBCD-POP methodology using language diversity data

Country	Population [thousand] (P)	Log P	No. languages spoken (L)	Log L	Expected log L value	Deviation from expected value (D)	Language diversity index LD-POP
Max value	6,056,710	6.78	12,000	4.08	2.48	1.60	1.000
PNG	4,809	3.68	833	2.92	1.34	1.58	0.994
Pakistan	141,256	5.15	76	1.88	1.88	0.00	0.477
Korea, DPR	22,268	4.35	2	0.30	1.58	-1.28	0.057

Minimum value	10,000	4.00	1	0.00	1.46	-1.46	0.000

Missing data. If data are missing for a particular indicator (LD, RD, ED, MD, or PD) within a component's cultural diversity (CD) or biodiversity (BD) parts, the remaining indicators are used to calculate that country's IBCD. For example, if a country is missing data for religion and ethnic groups, we used only languages to calculate the CD part of its IBCD; if data are missing for plants, we used only birds/mammals to calculate its BD part; and so on. However, a country must have at least one cultural diversity component and one biodiversity component to calculate its IBCD. Notes to the tables show which data are included for each country.

Additional remarks on the methodology. As noted above, for some indicators the maximum and minimum values used to fix the top and bottom of the scale are theoretical rather than observed. The drawback of using theoretical maxima and minima is precisely that they are theoretical; hence it can always be argued that they are arbitrary to some degree. Also, it is possible that the posited values could be superseded by new information or different interpretations of existing data. For example, the number of languages reported in *Ethnologue* has increased from edition to edition, not because previously unknown languages are found (although a few have been), but because the editors have reclassified dialects as separate languages based on new information and interpretations from field linguists. It has also been argued that there are a very large number—possibly several thousand—unreported deaf languages that need to be added to the world's total (Skutnabb-Kangas 2000). Therefore, it is possible the theoretical maximum number of languages used here will become obsolete when the next edition of *Ethnologue* appears. If so, then one would have to go back and recalculate the language data using the new, higher theoretical maximum.

Of course, the IBCD would also have to be recalculated if different datasets were chosen for the indicators. For example, the ethnic group classification used here, from the 2001 edition of the *World Christian Encyclopedia,* results in a much higher number of ethnic groups than is reported in some other sources in the anthropological literature. If, say, data were drawn from the Human Relations Area Files instead, the results of the IBCD might be completely different.

RESULTS

IBCD-RICH. IBCD-RICH is an unadjusted measure of a country's BCD richness. Results for IBCD-RICH (arranged alphabetically) are in Table 1. The highest- and lowest-ranked countries are shown in Figures 2 and 3, respectively.

The columns in Table 1 signify:

- **Total no. languages L:** the total number of languages spoken in the country. Here, the maximum is an observed value: 6,800, the world total number of languages reported in the 2000 edition of *Ethnologue* (Grimes 2000). The minimum is also an observed value: 1, the smallest number of languages reported for a single country.
- **Language Diversity Index, LD-RICH:** an index value of 1.0 is equivalent to 6,800 languages; a value of zero is equivalent to one language.
- **Total no. of religions R:** the number of religions reported for the country. Here, the maximum is an observed value: 10,000, the world total number of religions as estimated in the *World Christian Encyclopedia* (Barrett et al. 2001). The minimum is a theoretical value: 1, the number of religions in a religiously homogeneous country.
- **Religion Diversity Index, RD-RICH:** an index value of 1.0 is equivalent to 10,000 religions; a value of zero is equivalent to one religion.
- **No. of ethnic groups E:** the total number of ethnic groups reported for the country. Here, the maximum is an observed value: 12,583, the world total number of ethnic groups reported in the *World Christian Encyclopedia* (Barrett et al. 2001). The minimum is a theoretical value: 1, the number of ethnic groups that would be present in an ethnically homogeneous country.
- **Ethnic Group Diversity Index, ED-RICH:** an index value of 1.0 is equivalent to 12,583 ethnic groups; a value of zero is equivalent to one ethnic group.
- **Cultural Diversity, CD-RICH:** the index for the cultural diversity component of IBCD-RICH, which is the average of LD-RICH, RD-RICH, and ED-RICH. In cases where one or two are missing, the value(s) of the remaining indicator(s) is/are used.
- **Total no. bird and mammal species S**: the total number of bird and mammal species reported for the country. Here, the maximum is an observed value: 14,709, the world total number of bird and mammal species reported in Groombridge and Jenkins (2002). The minimum is a theoretical value, 1.
- **Bird and Mammal Diversity Index, MD-RICH:** an index value of 1.0 is equivalent to 14,709 species; an index value of zero is equivalent to one species.
- **Total no. plant species S**: the total number of plant species reported for the country. Here, the maximum is an observed value: 250,876, the world total number of plant species reported in Groombridge and Jenkins (2002). The minimum is a theoretical value, 1.
- **Plants Diversity Index, PD-RICH:** an index value of 1.0 is equivalent to 250,876 species, a value of zero is equivalent to one species.
- **Biological Diversity, BD-RICH:** the index for the biological diversity component of IBCD-RICH, which is the average of MD-RICH and PD-RICH. In cases where one is missing, the value of the other is used.
- **IBCD-RICH:** the average of CD- RICH and BD- RICH.

IBCD-AREA. IBCD-AREA is a relative measure of a country's BCD richness adjusted for its land area. Results for IBCD-AREA (arranged alphabetically) are in Table 2. The highest- and lowest-ranked countries are shown in Figures 3 and 4, respectively.

The columns in Table 2 signify:

- **Area (in km^2):** Country areas are taken from the *The Times Comprehensive Atlas of the World* (1999). The world's land area, excluding Antarctica, is 136.6 million km^2. Countries with areas of less than 1,000 km^2 were excluded from the analysis.
- **Log A:** the log of the area of the country.
- **Language diversity index, LD-AREA:** an index value of 1.0 is equivalent to 6,800 languages, the global total, in 136.6 million km^2, the world's land area. An index value of zero is equivalent to one language in one million km^2.
- **Religion diversity index, RD-AREA:** an index value of 1.0 is equivalent to 10,000 religions, the world total, in 136.6 million km^2. An index value of zero is equivalent to one religion in one thousand km^2.
- **Ethnic group diversity index, ED-AREA:** an index value of 1.0 is equivalent to 12.583 ethnic groups, the world total, in 136.6 million km^2. An index value of zero is equivalent to one ethnic group in ten thousand km^2.
- **Cultural diversity index, CD-AREA:** the index for the cultural diversity component of IBCD-AREA is the average of LD-AREA, RD-AREA, and ED-AREA (Table 21). In cases where one or two are missing, the value(s) of the remaining indicator(s) is/are used.

  Bird and Mammal diversity index, MD-AREA: an index value of 1.0 is equivalent to 14,709 bird and mammal species, the world total, in 136.6 million km^2. An index value of zero is equivalent to one species in ten km^2.

  Plant diversity index, PD-AREA: an index value of 1.0 is equivalent to 250,876 plant species, the world total, in 136.6 million km^2. An index value of zero is equivalent to ten species in ten km^2.
- **Biological Diversity index, BD-AREA:** the index for the biological diversity component of IBCD-AREA is the average of MD-AREA and PD-AREA. In cases where one is missing, the value of the other is used.
- **IBCD-AREA:** the average of Cultural Diversity AREA and Biological Diversity AREA.

IBCD-POP. IBCD-POP is a relative measure of a country's richness adjusted for its population size. Results for IBCD-POP (arranged alphabetically) are in Table 3. The highest- and lowest-ranked countries are shown in Figures 5 and 6, respectively.

The columns in Table 3 signify:

- **Population 2000 (thousand):** the country's population in 2000, expressed in thousands, as reported in UNPD (1998). The maximum is an observed value: 6.05 billion, the world's population in 2000; countries with populations of less than 10,000 were excluded from the calculations to prevent the least populated countries from skewing the index.

- **Language diversity index, LD-POP:** an index value of 1.0 is equivalent to 12,000 languages, roughly twice the world total number of languages reported in the 2000 edition of *Ethnologue* (Grimes 2000) and approximately equal to the number of ethnic groups in the world, in 6.05 billion population. This value was selected because the world is not more diverse than the most diverse country (Papua New Guinea) after adjusting for population. The zero index value is equivalent to one language in ten million population.
- **Religion diversity index, RD-POP:** an index value of 1.0 is 10,000 religions, the world total number of religions reported in the *World Christian Encyclopedia* (Barrett et al. 2001), in 6.05 billion population. The zero index value is equivalent to one religion in one million population.
- **Ethnic group diversity index, ED-POP:** an index value of 1.0 is equivalent to 12,583, the world total number of ethnic groups reported in the *World Christian Encyclopedia* (Barrett et al. 2001), in 6.05 billion population. The zero index value is equivalent to one ethnic group in one million population.
- **Cultural Diversity index, CD-POP:** the index for the cultural diversity component of IBCD-POP is the average of LD-POP, RD-POP, and ED-POP. In cases where one or two are missing, the value(s) of the remaining indicator(s) is/are used.
- **Bird and Mammal diversity index, MD-POP:** an index value of 1.0 is 30,000, approximately double the world total number of bird and mammal species, in 6.05 billion population. The zero index value is equivalent to 10 species in one million population.
- **Plant diversity index, PD-POP:** an index value of 1.0 is equivalent to 500,000, approximately double the world total number of plant species, in 6.05 billion population. The zero index value is equivalent to one hundred species in one million population.
- **Biological Diversity index, BD-POP:** the index for the biological diversity component of IBCD-POP is the average of MD-POP and PD-POP. In cases where one is missing, the value of the other is used.
- **IBCD-POP:** the average of CD-POP and BD-POP.

DISCUSSION

Differences among the three index components

IBCD-RICH. The most straightforward of the three components, IBCD-RICH produces index values that support earlier work (Harmon 1996) showing that most of the countries highest in species richness are also among the highest in language richness. Indeed, the IBCD-RICH results extend the scope of this finding, for while Harmon 1996 compared only endemic species and languages, IBCD-RICH covers both non-endemic and endemic species and languages, while adding religions and ethnic groups. Of the ten highest-ranked countries for IBCD-RICH (see Figure 2) all but one are within the top thirty countries in each of the subcomponents of IBCD-RICH. The lone exception is Nigeria, which ranks 64th in PD-RICH. In fact, most rank within the top 15 countries in each of the subcomponents (Table 4). This points to a rather strong consistency across both cultural and biological diversity indicators, at least at the highest levels of IBCD-RICH.

By virtue of their first and second rankings in IBCD-RICH, Indonesia and Papua New Guinea together constitute the world's leading "core area" of BCD richness. Several biogeographical factors—the presence of a vast archipelago, the highly variable terrain of New Guinea and the major Indonesian islands, and the fact that Wallace's Line bisects the area—along with the absence (until recently) of a strong colonial presence, which enabled small hunter–gatherer groups to persist here in numbers perhaps larger than anywhere else, probably combine to explain the diversification of biological species and human cultures. Brazil–Colombia–Peru make up a second core area of BCD richness, with Nigeria–Cameroon–Democratic Congo making a third. It is interesting to note that all three are ecoregions dominated by tropical rainforests – Wallacea/New Guinea, the Amazon basin and the Congo basin. The other countries highest in BCD richness—India, China, USA, Mexico, and Australia—are all subcontinental (in Australia's case, continental) in size and therefore encompass a large variety of ecosystems along with an array of indigenous cultures that have adapted to them, the latter producing high numbers of languages, religions, and ethnic groups.

Not surprisingly, the countries ranking lowest in IBCD-RICH (Figure 3) are all small islands (many of them in the Pacific), except for Greenland, which is large but heavily glaciated, and Cape Verde, Gibraltar, San Marino, three small mainland countries. Obviously, countries small in area are at a deep disadvantage in a tally based on richness alone.

The strengths of IBCD-RICH are:

- It is straightforward and easily grasped, relying on a simple count of entities (languages, religions, ethnic groups, and species) that people can readily understand.
- It requires no regression analysis of the data, as do IBCD-AREA and IBCD-POP.
- It produces index results that allow people to draw valid conclusions about the status of a country's BCD richness. For example, compared to the other top-10 IBCD-RICH countries, Colombia ranks lowest in all three cultural diversity subcomponents of IBCD-RICH: 23rd in LD-RICH, 21st in RD-RICH, and 28th in ED-RICH). Yet Colombia ranks 10th in IBCD-RICH overall. Even if we knew nothing else, we could

use this information to deduce that Colombia must not only be rich in species, but exceptionally rich, in order for it to make 10th overall in IBCD-RICH. And in fact that is precisely the case, for Colombia is the most species-rich country in the world, ranking 1st in both MD-RICH and PD-RICH.

Its weaknesses are:

- It is biased against small countries, particularly small island countries, and may lead to the mistaken impression that their BCD is somehow less important than that of larger countries.
- By depending solely on the number of bird, mammal and plant species, the biodiversity subcomponents of IBCD-RICH are biased towards higher vertebrates and plants at the expense of all other species. This is because birds, mammals and plants are the only taxonomic groups which have been comprehensively surveyed. Insects make up by far the largest group in the animal kingdom, and it is probable that there is a very large number of unrecorded species, particularly in the tropics. Plants have been reasonably well inventoried, but being a much larger group than either birds or mammals (an entire kingdom rather than a class) it is likely that many more plant species await discovery by science, again, particularly in tropical countries. Also, all marine species are excluded because of poor data for many countries, which therefore omits a large proportion of the biodiversity of islands and countries with extensive coasts, especially ones with tropical reef ecosystems.

Overall, IBCD-RICH appears to be a valuable means of measuring BCD, provided that appropriate caveats are given in terms of the accuracy of the data on which it is based, and of how the results are interpreted.

IBCD-AREA. By compensating for a country's area—that is, by statistically neutralizing size differences so that both small and large countries can be considered on an equal footing—IBCD-AREA helps correct for the inherent bias against small countries that exists within IBCD-RICH. Countries that would have no chance to rank in the upper echelons of IBCD-RICH do so within IBCD-AREA: countries such as Togo and Israel, for example, both of which exhibit high LD-AREA, MD-AREA, and PD-AREA values but which could never rank highly in LD-RICH, MD-RICH, and PD-RICH simply because of their small size (see Table 5). It is instructive to see such countries appear high in a global ranking because it reminds us that even small countries have unique contributions to make to the overall complement of global BCD.

The strengths of IBCD-AREA are:

- Area-adjustment.
- The data manipulations are based on a widely accepted theory.

Its weaknesses are:

- It requires regression analysis and thus is not as straightforward or easy to understand as IBCD-RICH.
- As noted above, the species-area relationship and the entire theory of island biogeography are well accepted in ecology; nonetheless, they remain within the realm of theory and as such are subject to continuing reinterpretation and critique. For example, the theory of island biogeography is considered by some scientists to be inapplicable to certain taxa in certain places (see, for example, the comments of Olson and James regarding Hawaii, cited in Stearns and Stearns 1999, 15–16). The point here is not to impugn the species-area relationship, but simply to remind us that calculations (such as IBCD-RICH) that are based upon it are subject to revisions of the underlying theory.
- If used alone, IBCD-AREA may leave the false impression that certain small countries have greater overall BCD than larger ones (e.g., Brunei ranking just ahead of India, Nepal ahead of Brazil, etc.). IBCD-AREA is designed to correct for the biases in IBCD-RICH, and therefore the two must be used in concert.

IBCD-POP. IBCD-POP is an extension of the species-area methodology upon which IBCD-AREA is based. IBCD-POP is an attempt to get at the relationship between human population size and the generation and maintenance of BCD. What this relationship is, remains murky; nevertheless, IBCD-POP generates some interesting results (see Table 6).

The strengths of IBCD-POP are:

- It assigns high index values to BCD-rich countries with relatively low human populations (e.g., French Guiana, Suriname, Guyana, Gabon), which is an intuitively plausible result. If, by contrast, densely populated and relatively BCD-homogeneous countries (e.g., Burundi, Bahrain) had achieved a very high ranking under IBCD-POP, one might be led to suspect that application of the basic species-area formula to population is entirely invalid.
- The fact that IBCD-POP produces results that seem to complement IBCD-RICH and IBCD–AREA (for more on this, see below) suggests that the IBCD–POP methodology is worth further investigation.

Its weaknesses are:

- It requires regression analysis and this is not as straightforward or easy to understand as IBCD-RICH.
- Extending the species-area relationship to per capita relationships is expedient and plausible, but nonetheless may turn out, upon further analysis, to be an invalid extension of the species-area formula; or at least may require some adjustment of that formula. In other words, the IBCD-POP methodology is promising but not proven.

Comparison of the three components: correlations. IBCD-RICH offers the most basic analysis of the available data. This method has both advantages and disadvantages. Simplicity is its most obvious virtue. However, it does not distinguish between countries or territories which have a high BCD only because they have a large land area or population and those which possess high diversity regardless of their land area or population. This is a disadvantage because countries are not being compared on a like-for-like basis. Is it surprising to learn that 119 languages are spoken in Russia, but only 7 in Reunion? IBCD-RICH does not shed much light on this question. A least-squares statistical analysis shows that there is a strong correlation ($R^2 \geq 0.6$) between countries' CD-RICH and BD-RICH values.

IBCD-AREA and IBCD-POP offer two alternative perspectives. IBCD-AREA is a robust method for analyzing biodiversity because the relationship between species richness and area (which was used to derive the index values of each country) is based on established ecological theory and observations, namely, that the number of species increases as a function of land area. It is reasonable to assume that the same relationship would be true for cultural diversity indicators. Interestingly, no single country or territory is more diverse than the world as a whole, after taking land area into consideration, for any of the five indicators used in IBCD-AREA. The global diversity value is therefore equivalent to the maximum index value. There is a good correlation ($R^2 > 0.57$) between number of languages and area, ethnic groups and area, bird/mammal species and area, and plant species and area. By contrast, there is only a moderate correlation between religions and area, and a poor correlation between CD-AREA and BD-AREA.

IBCD-POP is also based on the species-area relationship. While the analogous richness-population relationship might be intuitively apparent between a country or territory's cultural diversity and its population size, it is not obvious between biological diversity and human population. However, in IBCD-POP, there is a good correlation not only between language and population and ethnic groups and population, but also between birds/mammals and population, and plants and population. By contrast, there is only a moderate correlation between religion and population and a poor correlation between CD-POP and BD-POP.

The fact that the correlation between CD-AREA and BD-AREA and between CD-POP and BD-POP is relatively weak ($R^2 = 0.20$) means that countries with high cultural diversity do not necessarily have high biological diversity, and vice versa, after adjusting for either their land area or population size.Where there is no adjustment made, as in the IBCD-RICH index, there is a high correlation. Tables 7 and 8 show the actual values.

Comparison of the three components: rankings. Table 9, which summarizes the rankings for all three components, provides another basis for comparing the results among them. Perhaps the most striking aspect of the comparison is how consistently high Papua New Guinea and Indonesia rank under all three variants. Papua New Guinea ranks 2nd in IBCD-RICH, 2nd in IBCD-AREA, and 1st in IBCD-POP, with Indonesia ranking 1st, 1st, and 4th, respectively. By any measure, these two countries are the world leaders in BCD. Cameroon and Colombia are not far behind, being the only other two countries to rank in the top 10 under all three variants. When IBCD-RICH, -AREA, and –POP are themselves averaged (column 8 of Table 9), Papua New Guinea emerges slightly ahead of Indonesia, and so can lay claim to the title of the world's most bioculturally diverse country —at least by these measures.

The world's "core regions" of BCD

The world's four most bioculturally diverse countries—Papua New Guinea, Indonesia, Cameroon, and Colombia—rank in the top ten for all three components of the index. Papua New Guinea ranks 2nd in IBCD-RICH, 2nd in IBCD-AREA, and 1st in IBCD-POP, with Indonesia ranking 1st, 1st, and 4th, respectively. By any measure, these two countries are the world leaders in biocultural diversity. Cameroon and Colombia are not far behind, being the only other two countries to rank in the top 10 in all three components.

By combining the results of BCD-RICH, BCD-AREA, and BCD-POP, we identified three "core regions" of global biocultural diversity that include countries of various sizes and populations (Figure 7):

- The Amazon Basin, consisting of Brazil, Columbia, and Peru, which ranked highly in BCD-RICH; Ecuador, which ranked highly in BCD-AREA; and French Guiana, Suriname, and Guyana, which ranked highly in BCD-POP.
- Central Africa, consisting of Nigeria, Cameroon, and the Democratic Republic of Congo (BCD-RICH), Tanzania (BCD-AREA), and Gabon and Congo (BCD-POP).
- Indomalaysia/Melanesia, consisting of Papua New Guinea and Indonesia (BCD-RICH), Malaysia and Brunei (BCD-AREA), and Solomon Islands (BCD-POP).

Note that these regions are derived cumulatively; that is, they are geographic clusters centered on countries that are high in "raw" BCD richness (as measured by IBCD-RICH) to which adjacent countries highly ranked in IBCD-AREA and IBCD-POP are added. The resulting core regions are intuitively plausible in that they identify biogeographic realms that most experts would also identify as being among the most important for BCD: Indomalaya, the Amazon Basin, and Central Africa. We believe this is strong evidence that the three components of the IBCD give a more usable and realistic picture of where the world's BCD is located than would an index based on raw BCD richness alone.

Deepening the analysis: trend data

It bears keeping in mind that the IBCD is founded on basic richness data: more or less straightforward counts of the products of cultural and biological diversity. As we discussed earlier, all global indices are built up out of simple information such as this. However, there is no reason why the IBCD could not be extended by additional empirical analysis of these (and other) indicators of BCD. The most useful information to add would be time-series statistics on the numbers of speakers of each language, members of each ethnic group and religion, and population sizes for each species. This additional data would allow an analysis of the distribution of abundance and therefore a more accurate estimate of diversity. More importantly, it would allow trends to be tracked over time. For example:

- Trends in language use could be gauged by analyzing changes in the number of mother-tongue speakers of various languages, or by measuring changes in intergenerational transmission of language over time.

- Trends in religious adherence and ethnic group composition could be tracked by garnering demographic information on individual religions and ethnic groups.
- Trends in species could be supplemented by comparing the size of populations of species over time, or, in the absence of population data, by comparing species threat status from successive editions of the IUCN Red Books.
- Empirical data for other indicators of BCD, such as traditional environmental knowledge, could be gleaned (or solicited).

To illustrate what is possible, we next discuss in some detail how trends in language use might be studied, and briefly recount a recent empirical study of change in traditional environmental knowledge.

Global trends in numbers of mother-tongue speakers. One possible trend component would be a set of time-series data showing changes in the number of mother-tongue speakers of various languages. There are several sources of global language data dating back to the 1920s. The first (1924) edition of Meillet and Cohen's *Les Langues du Monde* gives numbers of speakers for some languages and language families; Tesnière's *Statistique des Langues de l'Europe* (1928) gives precise numbers for over 100 European languages. The second (1952) edition of Meillet and Cohen provides updated and more numerous figures. Other sources of global language data from years past include Voegelin and Voegelin 1977, Perrot 1981, Comrie 1987, Ruhlen 1987, and Gunnemark 1991.

Today, there are at least two published global language datasets: that of the Linguasphere Observatory (published in Barrett et al. 2001, and on-line at www.linguasphere.org), and the quadrennially updated *Ethnologue* series, published by the Summer Institute of Linguistics (now called SIL International). *Ethnologue* is probably the most widely cited source for global language data. In addition, UNESCO is undertaking a World Language Survey, which is as yet incomplete.

To get time-series data on the number of mother-tongue speakers of individual languages, we are assembling a dataset that is (to date) based primarily on three recent editions of *Ethnologue*. In previous work, one of the authors constructed a global database of the number of mother-tongue speakers based on the 1992 edition of *Ethnologue* (Harmon 1995, based on Grimes 1992), to which has been added data (for the Americas and Europe only, thus far) from the 1988 and 2000 editions (Grimes 1988; Grimes 2000) and data (for Europe only) from Tesnière 1928.

Hence, so far we have compiled three (sometimes four) data points for many European languages (i.e., 1928, 1988, 1992, and 2000) and three data points for the languages of the Americas (1988, 1992, and 2000). To the extent that these data are an accurate reflection of the number of speakers of these languages, they can point us toward some long-term trends in language vitality. However, as with all cultural diversity data, a number of cautions are in order:

- The figures reported in Tesnière 1928 may not be directly comparable with those reported in recent editions of *Ethnologue,* because of terminological ambiguities, changes in classification, or differences in counting techniques. On the other hand, it seems likely that for small, clearly defined languages, Tesnière's figures would be comparable to later *Ethnologue* figures.
- Within the editions of *Ethnologue,* changes in the number of mother-tongue speakers between 1988 and 2000 are often the result of better data becoming available rather than actual changes in populations, so for numerous languages apparent increases or declines are statistical artifacts and not reflections of reality.

Index of continuity and index of ability. In a quantitative study of vitality and moribundity (Norris 1998), Statistics Canada used 1996 census responses to calculate an "index of continuity" and an "index of ability" for the country's native languages. The index of continuity measures language vitality by comparing the number of people who speak it at home with the number who learned it as their mother tongue of origin. In this index, a 1:1 ratio is scored at 100, and represents a perfect maintenance situation in which every mother-tongue speaker keeps the language as a home language. Any score lower than 100 indicates a decline in the strength of the language. The index of ability compares the number who report being able to speak the language (at a conversational level) with the number of mother-tongue speakers. Here, a score of over 100 indicates that an increment of people have learned it as a second language, and may suggest some degree of language revival (Norris 1998, 10). Table 10 shows the main results of the study. All the elements of a thorough moribundity index are here: the size of the speaking population, indices of continuity and rejuvenation, and the average age of the speakers. By combining the two indices and adjusting the result by judiciously weighting the other factors, one could derive a quantitative measure of a given language's vitality or lack thereof. Doing this on a global scale would require every country to conduct a census as thorough as Canada's (which nonetheless still suffers from incomplete enumeration of some First Nations reserves).

Trends in Australia's Aboriginal languages. Drawing on a wide range of studies and precepts (including those described above in Norris 1998), McConvell and Thieberger (2001) put together a status report on the Aboriginal languages of Australia—arguably the most endangered body of indigenous languages in the world. This report is in many ways a model of its kind, especially in terms of its comprehensive treatment of the factors that produce moribundity (and vitality) in small languages as they struggle to co-exist with a large, sociopolitically dominant language. While their full methodology is too detailed to be discussed here, it will suffice to note that they make good use of census and other data to develop age-class analyses of particular Aboriginal languages. From these age-class data, they create an Endangerment Index for these languages, which is the percentage of speakers aged 0-19 divided by the percentage of speakers aged 20-39. The intent, of course, is to try to see whether there is a drop-off in speaker percentage among the youngest generation. Languages with an index value of greater than 1 are considered "strong"; those with values of less than 1, "endangered." McConvell and Thieberger go on to discuss a number of caveats and qualifications, especially concerning languages that had been considered "endangered" by earlier analysts (using different methods of analysis) but which rated higher than 1 in the Endangerment Index. These caveats, for example, point to potential problems with how census data on languages are to be interpreted. A main lesson from their study, which we noted at the outset of this paper, is that close familiarity with the situation "on the ground" and at relevant local scales is necessary for an accurate picture of cultural diversity.

Quantitative measurement of TEK change. The anthropologist Stanford Zent notes that in the ethnobotanical literature of the past two decades "it is extremely rare to find works that incorporate a time dimension" into studies of changes in traditional environmental knowledge (TEK) or even to find empirical studies of TEK change (Zent 2001, 190). To redress this, Zent carried out a study among the Piaroa, an indigenous ethnic group of Venezuela, which combined four research methods: (1) an ethnobotanical plot survey, (2) structured interviews, (3) informant consensus analyses, and (4) linear regression analyses. It will be seen that this research strategy is broadly interdisciplinary, combining botany, anthropology, and statistics to meld quantitative and qualitative information on a specific group at a subnational scale. Although the best way to measure TEK change would be through comparative baseline data, for many groups (such as the Piaroa) there is no information on TEK from an earlier, pre-disruption historical phase with which to compare contemporary changes. Zent reasons that evidence of variability within cultural knowledge foretells change in that knowledge, and so proposes an indirect method of inferring TEK change: "chart the pattern of knowledge variability within the Piaroa community" and then "study the relationship between this variability and social factors that are relevant indicators of the current situation of culture change" (Zent 2001, 196). Using the research strategy outlined above, Zent was able to demonstrate a drop in plant-naming competence among younger Piaroa and relate that decline to several social factors. This kind of technique holds promise for fine-grained studies of not only TEK, but of changes in other kinds of cultural diversity indicators for which quantitative time-series data are difficult or impossible to get.

Deepening the analysis: endemism

In previous BCD research (Harmon 1996; Harmon 2002), comparisons have shown a high degree of overlap between the countries richest in endemic languages and those richest in endemic species. That research was based on data available in 1992. Here, we have updated data on endemic languages from the 2000 edition of *Ethnologue* (Grimes 2000) and on species from the latest global biodiversity assessment (Groombridge and Jenkins 2002). Although the three IBCD components presented here do not make use of data on endemics, we have included this information in the data tables to use as a springboard for discussing endemism. As a beginning, in Table 11 we have recalculated the concordance of the top 25 countries in species and language endemism in order to provide a comparison of rankings with the earlier study. In general, both the rankings and the concordance between the two top-25 lists remain the same. This kind of analysis, greatly expanded so as to discuss the implications of endemism for a global reckoning of BCD, could be part of an expanded version of the IBCD. (For more, see the Appendix, especially its concluding paragraph.)

CONCLUSION

Uses of the IBCD

Why should anyone try to put numbers on biocultural diversity in the first place? We certainly do not claim that an index such as the IBCD captures the richness of the world's biocultural fabric—the lived-in depth of feeling that traditional indigenous communities express through their cultural practices, or the sense of place that many non-indigenous people feel toward where they live, to give two examples. Rather, the value of an IBCD and similar measures is largely practical and political. Pinpointing the world's areas richest in biocultural diversity helps raise the awareness of the general public (and opinion-leading organizations such as the news media) about what is at stake. That can help lead to changes in personal attitudes toward cultures and places not their own, with the effect (one hopes) of engendering more understanding and respect among people everywhere. That, in turn, should lead to more enlightened public policy.

In any national-level ranking system there is a risk that some people may be tempted to write off lower-ranked countries as being "less valuable" in terms of the characteristic(s) at issue. As far as the IBCD goes, this would be a fundamental mistake: every country's biocultural diversity, no matter where it ranks, is an important part of the global whole, and the global whole is inherently worth preserving. Having said that, however, the IBCD could be used to help prioritize strategic investments in biocultural diversity conservation. The three "core regions" identified above are in that sense analogous to several well-known schemes for identifying the world's most important area for species conservation that have been developed over the last decade, including biodiversity hotspots (Myers et al. 2002), a globally representative network of ecoregions (Olson et al. 2001), endemic bird areas (Stattersfield et al. 1998), and centers of plant diversity (Davis et al. 1994).

The IBCD could also be adapted to play an important role in fulfilling the goals of the Convention on Biological Diversity (CBD). The CBD has set ambitious targets, to be met by 2010, for significantly reducing the rate of biodiversity loss worldwide. In February 2004, the CBD's seventh Conference of the Parties (COP7) proposed a suite of quantitative indicators to be used in measuring progress toward hitting the 2010 target. One of the goals of the CBD is to "maintain [the] socio-cultural diversity of indigenous and local communities" (CBD 2004:12). In line with this, COP7 specifically recognized the "status of traditional knowledge, innovations and practices" as one of its focal areas, and identified the "status and trends of linguistic diversity and numbers of speakers of indigenous languages" as a possible indicator (CBD 2004:8). The IBCD could be expanded to include time-series data on linguistic diversity in order to help make this indicator a reality. It also may be possible to incorporate into the IBCD other measures of change in the intergenerational transmission of traditional environmental knowledge.

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APPENDIX: MEASURING CULTURAL DIVERSITY—GREENBERG'S INDICES AND ELFs

Greenberg's Linguistic Diversity Indices

In an influential paper published in 1956, the linguist Joseph Greenberg proposed eight indices of linguistic diversity. The indices are based on the probability of two members of a population sharing the same language. Greenberg identified the indices with the letters A through H. Briefly, the indices are as follows:

- The A Index (Monolingual Nonweighted Method) measures the probability that two randomly chosen individuals from a population in a given area will speak the same language.
- The B Index (Monolingual Weighted Method) modifies the A Index by adding a multiplier (the "resemblance factor") to weight the index so that it registers a higher diversity for areas that have a number of unrelated or distantly related languages than for those having the same number of closely related languages. The resemblance factor is calculated by comparing a fixed basic word list for each language.
- The A and B indices are called "monolingual" because each individual is counted as a speaker of only one language, his or her dominant one. The C (Split-Personality Nonweighted Method) and D indices (Split-Personality Weighted Method) account for polylingualism by counting speakers of two languages as two people, of three languages as three people, and so on; the D Index is weighted in the same manner as in B.
- The E (Random Speaker Nonweighted Method) and F indices (Random Speaker Weighted Method) suppose that an individual is chosen from the population at random and that, if polylingual, it is equally probable that he or she will speak any one of the languages. A second speaker is chosen the same way. Their probability of their speaking the same language is the E Index; the probable measure of resemblance among their languages is the F Index.
- The G Index (Random Speaker–Hearer Method) measures the probability that a randomly chosen individual is likely to understand the language spoken by a second individual if that individual is polylingual and is equally likely to speak any of the languages at his or her command.
- The H Index (Index of Communication) is the probability that two randomly chosen members of a population will have at least one language in common.

While indices B through G are methodologically the most sophisticated and potentially the most descriptive of real-world conditions (especially in regions of the world where polylingualism is still prevalent), they present great difficulties in terms of obtaining the necessary data to calculate them on anything but the smallest scales. The B Index requires the calculation of a resemblance factor for each language in question through a series of comparisons of basic vocabulary lists. Greenberg himself acknowledged that the indices measuring polylingualism (C, D, E, F, and G) take no account of the individual's relative command of each language he or she knows, and, in any event "satisfactory measures have not as yet been developed, and, if developed could hardly be applied on a scale which would allow them to be ascertained for an entire population" (Greenberg 1956 [1971:73]). Because of these considerations, we will disregard indices B through G and continue with a discussion of A and H only.

The A Index, again, measures the probability that two randomly chosen individuals from the population in a given area will speak the same language. It is calculated according to the following formula:

$$\underline{A} = 1 - \Sigma_i (i^2)$$

where i successively takes on the value of the proportion of speakers of a given language to the entire population of the area in question. The sum of these squared proportions is subtracted from 1 because we are measuring diversity rather than uniformity, and this makes lower values represent lower diversity. Hence, 0 represents the extreme situation in which everyone in a given area speaks the same language, and 1 the opposite situation, in which everyone in a given area speaks a different language. Greenberg gives a simple example. If, in a given area, one-eighth of the population speak language M, three-eighths speak N, and one-half speak O, and if the proportion of speakers of the three languages to the total population is designated m, n, and o, respectively, then the A value for that area is:

$$\underline{A} = 1 - (m^2 + n^2 + o^2)$$
$$\underline{A} = 1 - (0.125^2 + 0.375^2 + 0.5^2)$$
$$\underline{A} = 1 - (0.015625) + 0.140625 + 0.25) = 0.59375$$

which is conventionally truncated to three (or two) decimal places.[5] In this example, then, A = 0.593.

The H Index, again, measures the probability that two randomly chosen members of a population will have at least one language in common. "This measure," Greenberg notes, "indicates the actual possibility of communication among any two people taken at random. As such it is the most responsive of all to such phenomena as the spread of auxiliary [i.e., non-mother tongue] languages" (Greenberg 1956 [1971:72]). As a nonweighted index, H is obtained in the same general manner as A, except the population is now divided into proportions of speakers of any one language only or any particular combination of languages. Then the products of each pair of such proportions are calculated, and "the proportions are multiplied by 1 if there is at least one common language among the languages corresponding to each factor in the product.... The sum of these products is then obtained. In this case, it seems advisable not to subtract from 1: if we did, we would have an index of noncommunication" (Greenberg 1956 [1971:72]).

Greenberg gives this example. Let there be five languages, M, N, O, P, and Q. In a given area, one-fifth of the population speaks M only, one-tenth speaks N only, one-tenth speaks O only, one-tenth speaks P only, one-tenth speaks Q only, one-tenth speaks both

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5 Sometimes the leading zero is omitted. However, hereafter we will express such indices with the leading zero and to three decimal places. In cases where the source calculates only to two decimal places, e.g., the Greenberg A Index reported in the 2000 edition of *Ethnologue* (Grimes 2000), a trailing zero will be added.

M and N, one-tenth speaks both M and O, one-tenth speaks both M and P, and one-tenth speaks both M and Q. First, all the possible pairwise combinations of languages are calculated: Then, as noted above, each proportion is multiplied by 1 if there is at least one common language among the languages corresponding to each factor in the product, and the products are summed. When all is said and done, the H value in this example is 0.480 (Greenberg 1956 [1971:72-73]).

How do A and H indices compare when calculated from real-life data? Greenberg provides an example using 1930 census data from Mexico (Table A-1). In this example, the relationship between A and H is largely, but not perfectly, inverse. The five highest-ranking states on the A Index rank 30th, 26th, 24th, 29th, and 27th, respectively, on the H Index; while the five highest-ranking states on the H Index rank 28th and 27th, 24th, and 23rd and 30th, respectively, on the A Index.

Of the eight indices Greenberg proposed, the A Index has found the most favor because it is the simplest and most straightforward to calculate. Because it can potentially be derived from census data, the A Index offers the possibility of tracking changes in linguistic diversity over time. Lieberson and co-workers did just this in a study of 34 countries that used census data dating from 1880 to 1970 (Lieberson et al. 1975 [1981]). Table A-2 shows the results, and extends them by including the A Index calculated for these countries in the 2000 edition of *Ethnologue* (Grimes 2000).[6] The three countries whose A increased the most over the period were Italy, Estonia, and Sweden, and the three whose A decreased the most were Poland, Romania, and Bulgaria. Lieberson et al. 1975 [1981] offered some hypotheses to explain this change.

The Greenberg A Index would seem, then, to be a good candidate for the linguistic diversity component of the IBCD. However, the matter is not so simple. It could be argued that the A Index actually gauges *linguistic concentration* rather than linguistic diversity. By measuring the probability that two individuals will speak the same language, the A Index is driven down in countries where one language dominates, even if there are many small languages also spoken there. Table A-3 illustrates this by listing the A Index for countries with 50 or more endemic languages (as calculated from data in Grimes 2000). The countries with the lowest A indices are those that are dominated by a single (usually colonial) language. Not surprisingly, these countries also tend to have the highest number of recorded endemic language extinctions. It could indeed be argued that the A Index for a particular country might be considered a rough indicator of the likelihood (or at least the risk) that its endemic languages could become extinct.

What this suggests is that the A Index accurately reflects endemic language richness only in countries where no single language predominates. In other words, the A Index does not capture the full linguistic richness of many countries that have small endemic languages. It may, on the other hand, capture the language richness of a linguistically heterogeneous country whose diversity derives from an influx of immigrant languages. Note in Table A-3 that the A values for Canada and the USA are relatively high compared with that of

[6] Previous editions of *Ethnologue* did not include an A Index calculation.

the third country in North America, Mexico. We might surmise that this is because Canada and the USA have much higher immigration rates from different linguistic source-communities around the world than does Mexico.

Rae and Taylor's Cross-Cutting (XC) Index

In the terminology of political science, "cleavages" are lines of division within a community, whether they be religious, interest-group, voting, or any number of others. "Cross-cutting" is "the extent to which individuals who are in the same group on one cleavage are in different groups on the other cleavage" (Rae and Taylor 1970, 23, 92). Hypothesizing a simplified political situation in which there are two cleavages, x_1 and x_2, Rae and Taylor devised a Cross-Cutting (XC) Index that is expressed as follows:

$$XC = \frac{A + B}{N^I(N^I - 1) / 2}$$

where A is the number of pairs whose members are in the same group of X_1 but in different groups of X_2, and B is the number of pairs whose members are in different groups of X_1 but in the same group of x_2. The total number of pairs is $N^I(N^I - 1) / 2$, with N^I being the number of individuals in the overlap. Calculating A and B is a matter of constructing a matrix (called a "contingency table") with the two cleavages and then summing all the pairwise comparisons across the rows and down the columns of the matrix, in a manner similar to that used to calculate H above.

The advantage of the XC Index is that it is a quantitative representation of an important phenomenon, for cross-cutting "can have crucial consequences for the intensity of feelings generated" among ethnic groups: political theory holds that the presence of cross-cutting will result in a moderation of attitudes and actions, as opposed to cross-reinforcing cleavages, which tend to intensify them (Yeoh 2001, 13). But as Yeoh also points out, "it is practically impossible to measure such complex links" because XC would require a detailed field survey to determine the proportion of members of one type of ethnic group who also belong to other types of groups (Yeoh 2001, 13).

This is a point which can be generalized to all indices of cultural diversity at larger scales, e.g., the country level: namely, while it is possible to devise indices (both weighted and unweighted) that can mathematically represent the complex realities of ethnic, religious, and linguistic interaction that are the true reflection of cultural diversity, the computations required quickly become so complicated (when more than two or three indicators/cleavages are taken into account), and the data required to quantify the indicators/cleavages so difficult to gather, that the calculation of such complex indices is impractical. In other words, paradoxically, the only tenable way to represent a complex cultural reality is by means of a pared-down measure that borders on an over-simplification. In his book *The Wellbeing of Nations* Robert Prescott-Allen hints at the paradox in his discussion of the three criteria for an ideal indicator. The indicator must be *representative*—covering the most important aspects of what is being measured while showing trends over time and differences between places and groups of people. It must be *reliable*—based on accurate data that have been gathered with sound and consistent sampling procedures. It must be *feasible*—based on data that are already available or which can be gathered at a reasonable cost (Prescott-Allen 2001, 280-281). Complex indices that show interactions between multiple factors, such as Greenberg's B–G indices and Rae and Taylor's XC Index, meet (or could conceivably meet) the first two criteria, but probably will fail badly on the third. Therefore, the major constraint on building an comprehensive cultural diversity index is the feasibility of gathering the data needed.

All this notwithstanding, the fact that we have to fall back on simple indices does not mean that these indices are worthless. Again, it is paramount to keep in mind the purposes of the IBCD (and other similar global-level indices) and to not overstate what they signify.

Ethnolinguistic Fractionalization Indices

Ethnolinguistic fractionalization indices (ELFs) are very similar to Greenberg's diversity indices. As the name denotes, ELFs measure the probability that two people from a given area, chosen at random, will be from different ethnic groups. ELFs are calculated using a Herfindahl concentration formula (as it is known in political science):

$$ELF = 1 - \sum_{i=1}^{n} \left(\frac{n_i}{N} \right) \left(\frac{n_i - 1}{N - 1} \right)$$

where n_i is the number of members of the ith group and N is the total number of people in the population. This formula is almost identical to Greenberg's.

Using data from one of the 20th century's landmark compendiums of culture-group data, the *Atlas Narodov Mira,* or *New World Atlas (*State Geological Committee of the Soviet Union 1964), Taylor and Hudson included an ELF for 129 countries in the first edition of their *Handbook of Political and Social Indicators* (1972). This ELF has subsequently seen wide use in the fields of political science and econometrics. Political scientists want to know what role ethnic diversity plays in decision-making, while economists focus on the effect of national-level ethnic diversity on economic growth and development. In political science analyses, a typical conclusion is that ethnic heterogeneity tends to hamper efficient government because the ethnic group(s) in power tend to focus on redistributing public goods to their compatriots rather than on making sound policy (e.g., La Porta et al. 1999; Collier 1999). In econometric analyses, a typical conclusion is that ethnic fragmentation explains the presence of social characteristics (such as low levels of formal schooling and political instability) that negatively affect economic growth (e.g., Easterly and Levine 1997).

In a critique of the use of conventional ELFs, Posner (2000) highlights a fundamental methodological issue that bears upon the IBCD. While not taking issue with the basic conclusions of the above-cited studies, Posner notes that the ELF is designed to measure, not ethnolinguistic diversity *per se*, but *politically salient* ethnolinguistic diversity. Yet the *Atlas Narodov Mira* data covers (or purports to cover) *all* ethnolinguistic groups, no matter how small. This leads to what Posner calls the "problem of inclusion":

> This is the problem of enumerating dozens of groups in each country that may be culturally or linguistically distinct from their neighbors but that are irrelevant as political actors in their own right. In some cases, this is because these groups fold themselves into broader political coalitions when it comes to competing over resources and national-level policy outcomes. In other instances, it is because they simply do not participate in politics as distinct, recognizable groups.... My assertion is not that the many ethnic groups included in the *Atlas* are unimportant *per se*. Rather, my claim is that these groups are unimportant for the political mechanism that the ELF measure is being used to test.... In all of these models [i.e., those of Collier 1999, La Porta et al, 1999, and Easterly and Levine 1997], the relevant competition is that between mobilized, ethnically-defined interest groups. To capture the contribution that a country's ethnic heterogeneity makes to such a process requires an index of fractionalization that reflects the groups that are actually doing the competing. The problem with the ELF index is that it does not do this: it includes dozens of groups that are irrelevant to the process that it is employed to capture (Posner 2000).

As an alternative, Posner proposes a PREG (Politically Relevant Ethnic Group) Index that cuts out small groups that are considered either not distinct or not important political actors at the national level.

A second problem with ELFs, says Posner, is that they convey "no information about the depth of the divisions that separate members of one group from another."

> Yet this factor certainly matters. In practice, what shapes the public policies selected by governments is often not so much the number or comparative sizes of the ethnic groups in the political system as the depth of the divisions between them. To take one example, the probability of randomly choosing two people from different ethnic groups in Malaysia and Switzerland (or, according to the values in the ELF index, Israel and Kuwait!) is roughly equivalent. But few people would claim that the salience of ethnicity for explaining economic policy choices in these countries is comparable. By not capturing the depth of the ethnic cleavages, indices of ethnic fractionalization leave out a potentially important part of the explanation (Posner 2000).

Finally, ELFs assume that group political relevance is proportional to population share, which is rarely true, nor do they give a sense of shifts in political power over time (Posner 2000).

Fractionalization Indices versus Diversity Indices

For our purposes, the important point Posner raises is that the aim of ELFs—of any fractionalization index—is not the same as the purpose of the IBCD. What Posner rightly criticizes as a shortcoming of ELFs in the context of political scientific or econometric analysis is precisely the opposite in the context of the IBCD: we *want* to include the full range of discrete cultural groups, whether or not they are "relevant," "powerful," or closely related in terms of their views and beliefs.

Posner gives a "glaring example of problematic inclusion" that illustrates the point. He notes that the *Atlas Narodov Mira* includes a miscellaneous category of "others and unknowns," which is incorporated in the fractionalization calculation of every country in the Taylor-Hudson ELF dataset. "In most cases," Posner notes, "this 'group' is so small relative to the rest of the population that its inclusion has little effect on the resultant ELF value. But in a handful of cases, the mistaken inclusion of 'others and unknowns' in the calculation does have a marked effect: in the Seychelles, for example, where the *Atlas* identifies just two groups ('French' and 'others and unknowns') [and] including 'others and unknowns' raises the country's fractionalization index value from 0 to 0.33" (Posner 2000). From the IBCD's perspective, the inclusion of "others and unknowns" is anything but a mistake, and the ELF value of 0.33 is more valid to analysis of BCD than the value of 0.00.

In sum, we can say that fractionalization indices are fundamentally different from diversity indices in terms of what they are trying to accomplish. Fractionalization indices are designed to test the effects of diversity on cleavages and therefore concern themselves with establishing the differences between politically relevant ethnic groups. Probability indices do not give enough weight to broad diversity embedded in the small, politically powerless ethnolinguistic groups. Yeoh (2001) says that it is beneficial to use different criteria to calculate an ELF (which is what he does in calculating his Ethnic Fractionalization Index), whereas Posner criticizes doing that. For our purposes, Yeoh's approach is right.

How one measures diversity depends on how one *defines* diversity. Fractionalization indices define diversity in terms of a probability of two people sharing a characteristic. That number will drop the more disproportionately a single characteristic dominates within a country. When one considers the imbalance between the great number of languages that are each spoken by only a small number of people, and the very few largest languages whose mother-tongue speakers comprise over 90% of the world's people, then we have to ask how we can truly measure diversity in such a situation. Here, it seems that endemism is a key to reckoning diversity on a global scale, because numerically small endemic languages (or species) are equivalent to the largest, most widespread languages (or species) in terms of the distinct, unique contribution they make to overall "sum total" of diversity worldwide.

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Table 1. IBCD-RICH, a biocultural diversity richness index.

Country or Territory	Total no. languages L	Language diversity index, LD-RICH	Total no. of religions R	Religion diversity index, RD-RICH	No. of Ethnic groups E	Ethnic Group diversity index, ED-RICH	Cultural Diversity Index, CD-RICH	Total no. bird and mammals species S	Birds and mammals diversity index, MD-RICH	Total no. plant species S	Plants diversity index, PD-RICH	Biological Diversity Index, BD-RICH	Index of Biocultural Diversity, IBCD-RICH
WORLD/theoretical max value	6,800	1.000	10000	1.000	12,583	1.000	1.000	14709	1.000	250876	1.000	1.000	1.000
Afghanistan	49	0.441	14	0.287	70	0.450	0.393	354	0.612	4000	0.667	0.639	0.516
Albania	7	0.221	7	0.211	12	0.263	0.232	298	0.594	3031	0.645	0.619	0.425
Algeria	22	0.350	10	0.250	44	0.401	0.334	284	0.589	3164	0.648	0.618	0.476
American Samoa	6	0.203	5	0.175	10	0.244	0.207	37	0.376	471	0.495	0.436	0.321
Andorra	5	0.182	6	0.195	11	0.254	0.210	157	0.527	1350	0.580	0.553	0.382
Angola	42	0.424	45	0.413	60	0.434	0.424	1041	0.724	5185	0.688	0.706	0.565
Anguilla	2	0.079	6	0.195	5	0.170	0.148	7	0.209	321	0.464	0.337	0.242
Antigua & Barbuda	4	0.157	6	0.195	6	0.190	0.180	56	0.419	1158	0.567	0.493	0.337
Argentina	41	0.421	31	0.373	64	0.441	0.411	1217	0.740	9372	0.736	0.738	0.575
Armenia	11	0.272	7	0.211	25	0.341	0.275	326	0.603	3553	0.658	0.630	0.452
Aruba	4	0.157	10	0.250	7	0.206	0.204	80	0.457	460	0.493	0.475	0.340
Australia	315	0.652	83	0.480	133	0.518	0.550	901	0.709	15638	0.777	0.743	0.646
Austria	20	0.339	15	0.294	46	0.406	0.346	296	0.593	3100	0.647	0.620	0.483
Azerbaijan	36	0.406	6	0.195	35	0.377	0.326	347	0.610	4300	0.673	0.641	0.483
Bahamas	5	0.182	6	0.195	9	0.233	0.203	100	0.480	1111	0.564	0.522	0.363
Bahrain	10	0.261	9	0.239	14	0.280	0.260	45	0.397	195	0.424	0.410	0.335
Bangladesh	44	0.429	27	0.358	61	0.435	0.407	420	0.629	5000	0.685	0.657	0.532
Barbados	2	0.079	10	0.250	11	0.254	0.194	30	0.354	572	0.511	0.433	0.313
Belarus	9	0.249	10	0.250	26	0.345	0.281	295	0.593	2100	0.615	0.604	0.443
Belgium	27	0.373	14	0.287	34	0.374	0.345	238	0.570	1550	0.591	0.581	0.463
Belize	14	0.299	11	0.260	19	0.312	0.290	481	0.644	2894	0.641	0.642	0.466
Benin	54	0.452	46	0.416	58	0.430	0.433	495	0.647	2500	0.629	0.638	0.535
Bermuda	1	0.000	7	0.211	7	0.206	0.139	11	0.250	167	0.412	0.331	0.235
Bhutan	31	0.389	12	0.270	27	0.349	0.336	608	0.668	5468	0.692	0.680	0.508
Bolivia	47	0.436	40	0.401	58	0.430	0.422	783	0.694	17367	0.785	0.740	0.581
Bosnia-Herzegovina	7	0.221	5	0.175	20	0.317	0.238	290	0.591		▯	0.591	0.414
Bougainville		▯	35	0.386	35	0.377	0.381		▯		▯	▯	▯
Brazil	246	0.624	183	0.566	224	0.573	0.588	1886	0.786	56215	0.880	0.833	0.710
British Indian Ocean Terr	1	0.000			5	0.170	0.085	23	0.329	101	0.371	0.350	0.218
British Virgin Islands	2	0.079	6	0.195	8	0.220	0.164		▯		▯	▯	▯
Brunei	19	0.334	17	0.308	19	0.312	0.318	516	0.651	6000	0.700	0.675	0.497
Bulgaria	17	0.321	7	0.211	35	0.377	0.303	321	0.601	3572	0.658	0.630	0.466
Burkina Faso	67	0.476	58	0.441	80	0.464	0.461	482	0.644	1100	0.563	0.604	0.532
Burundi	4	0.157	10	0.250	14	0.280	0.229	558	0.659	2500	0.629	0.644	0.437
Cambodia	22	0.350	23	0.340	37	0.383	0.358	430	0.632		▯	0.632	0.495
Cameroon	288	0.642	250	0.599	297	0.603	0.615	1099	0.730	8260	0.725	0.728	0.671
Canada	153	0.570	18	0.314	152	0.532	0.472	619	0.670	3270	0.651	0.660	0.566
Cape Verde	2	0.079	6	0.195	7	0.206	0.160	43	0.392	774	0.535	0.463	0.312
Cayman Islands	4	0.157	7	0.211	6	0.190	0.186	53	0.414	539	0.506	0.460	0.323
Central African Republic	80	0.497	64	0.452	95	0.482	0.477	746	0.689	3602	0.659	0.674	0.575
Chad	135	0.556	66	0.455	136	0.520	0.510	504	0.648	1600	0.593	0.621	0.566
Channel Islands		▯	8	0.226	6	0.190	0.208		▯		▯	▯	▯
Chile	14	0.299	16	0.301	25	0.341	0.314	387	0.621	5284	0.690	0.655	0.484

China	207	0.604	156	0.548	254	0.587	0.580	1494	0.762	32200	0.835	0.798	0.689
Christmas Island		▯			8	0.220	0.220		▯		▯	▯	▯
Cocos (Keeling) Islands		▯			5	0.170	0.170		▯		▯	▯	▯
Colombia	101	0.523	77	0.472	99	0.487	0.494	2054	0.795	51220	0.872	0.834	0.664
Comoros	7	0.221	5	0.175	11	0.254	0.216	62	0.430	721	0.529	0.480	0.348
Congo	66	0.475	61	0.446	79	0.463	0.461	649	0.675	6000	0.700	0.687	0.574
Congo, Dem Rep (Zaire)	221	0.612	173	0.560	260	0.589	0.587	1379	0.753	11007	0.749	0.751	0.669
Cook Islands	6	0.203	3	0.119	8	0.220	0.181	28	0.347	284	0.454	0.401	0.291
Costa Rica	12	0.282	14	0.287	22	0.327	0.299	805	0.697	12119	0.756	0.727	0.513
Cote d'Ivoire (Ivory Coast)	92	0.512	77	0.472	103	0.491	0.492	765	0.692	3660	0.660	0.676	0.584
Croatia	7	0.221	6	0.195	31	0.364	0.260	300	0.594	4288	0.673	0.634	0.447
Cuba	4	0.157	15	0.294	15	0.287	0.246	168	0.534	6522	0.706	0.620	0.433
Cyprus	6	0.203	6	0.195	10	0.244	0.214	100	0.480	1682	0.597	0.539	0.376
Czech Republic	10	0.261	7	0.211	26	0.345	0.272	280	0.587	1900	0.607	0.597	0.435
Denmark	15	0.307	10	0.250	29	0.357	0.305	239	0.571	1450	0.585	0.578	0.441
Djibouti	5	0.182	5	0.175	10	0.244	0.200	187	0.545	826	0.540	0.543	0.372
Dominica	4	0.157	10	0.250	10	0.244	0.217	64	0.433	1228	0.572	0.503	0.360
Dominican Republic	9	0.249	14	0.287	14	0.280	0.272	156	0.526	5657	0.695	0.611	0.441
Ecuador	28	0.378	26	0.354	33	0.370	0.367	1690	0.775	19362	0.794	0.784	0.576
Egypt	21	0.345	12	0.270	38	0.385	0.333	251	0.576	2076	0.614	0.595	0.464
El Salvador	9	0.249	14	0.287	15	0.287	0.274	386	0.621	2911	0.642	0.631	0.453
Equatorial Guinea	13	0.291	10	0.250	23	0.332	0.291	457	0.638	3250	0.650	0.644	0.468
Eritrea	19	0.334	10	0.250	16	0.294	0.292	431	0.632		▯	0.632	0.462
Estonia	17	0.321	6	0.195	24	0.337	0.284	278	0.586	1630	0.595	0.591	0.437
Ethiopia	88	0.507	118	0.518	145	0.527	0.518	903	0.709	6603	0.707	0.708	0.613
Faeroe Islands	2	0.079	3	0.119	5	0.170	0.123	119	0.498	236	0.439	0.469	0.296
Falkland Is (Islas Malvinas)	1	0.000			6	0.190	0.095	64	0.433	165	0.411	0.422	0.258
Fiji	22	0.350	11	0.260	30	0.360	0.324	78	0.454	1518	0.589	0.522	0.423
Finland	24	0.360	11	0.260	31	0.364	0.328	308	0.597	1102	0.563	0.580	0.454
France	69	0.480	21	0.331	97	0.485	0.432	362	0.614	4630	0.679	0.646	0.539
French Guiana	15	0.307	19	0.320	24	0.337	0.321	372	0.617	5625	0.695	0.656	0.488
French Polynesia	11	0.272	8	0.226	15	0.287	0.261	60	0.427	959	0.552	0.489	0.375
Gabon	41	0.421	34	0.383	51	0.417	0.407	656	0.676	6651	0.708	0.692	0.549
Gambia	23	0.355	11	0.260	32	0.367	0.328	397	0.624	974	0.553	0.589	0.458
Georgia	26	0.369	7	0.211	35	0.377	0.319	265	0.582	4350	0.674	0.628	0.473
Germany	72	0.485	21	0.331	79	0.463	0.426	315	0.599	2682	0.635	0.617	0.522
Ghana	84	0.502	86	0.484	108	0.496	0.494	751	0.690	3725	0.661	0.676	0.585
Gibraltar	2	0.079	6	0.195	7	0.206	0.160	41	0.387	600	0.515	0.451	0.305
Greece	24	0.360	11	0.260	31	0.364	0.328	346	0.609	4992	0.685	0.647	0.488
Greenland	2	0.079	5	0.175	5	0.170	0.141	71	0.444	529	0.504	0.474	0.308
Grenada	3	0.124	9	0.239	10	0.244	0.202	65	0.435	1068	0.561	0.498	0.350
Guadaloupe	3	0.124	8	0.226	7	0.206	0.185	63	0.432	1400	0.583	0.507	0.346
Guam	9	0.249	8	0.226	13	0.272	0.249	20	0.312	330	0.466	0.389	0.319
Guatemala	56	0.456	13	0.278	65	0.442	0.392	708	0.684	8681	0.729	0.707	0.549
Guinea	41	0.421	18	0.314	44	0.401	0.378	599	0.666	3000	0.644	0.655	0.517
Guinea-Bissau	24	0.360	19	0.320	32	0.367	0.349	351	0.611	1000	0.556	0.583	0.466
Guyana	18	0.328	20	0.325	24	0.337	0.330	871	0.705	6409	0.705	0.705	0.518
Haiti	3	0.124	11	0.260	9	0.233	0.206	95	0.475	5242	0.689	0.582	0.394
Honduras	16	0.314	17	0.308	27	0.349	0.324	595	0.666	5680	0.695	0.681	0.502
Hungary	21	0.345	9	0.239	23	0.332	0.305	288	0.590	2214	0.620	0.605	0.455
Iceland	2	0.079	10	0.250	10	0.244	0.191	99	0.479	377	0.477	0.478	0.334
India	414	0.683	293	0.617	439	0.645	0.648	1313	0.748	18664	0.791	0.770	0.709
Indonesia	736	0.748	535	0.682	744	0.700	0.710	2034	0.794	29375	0.827	0.811	0.760
Iran	73	0.486	23	0.340	78	0.462	0.429	463	0.640	8000	0.723	0.681	0.555
Iraq	29	0.382	10	0.250	36	0.380	0.337	253	0.577		▯	0.577	0.457

Ireland	5	0.182	8	0.226	21	0.323	0.244	167	0.533	950	0.551	0.542	**0.393**
Isle of Man	2	0.079	4	0.151	5	0.170	0.133		▯		▯	▯	▯
Israel	52	0.448	18	0.314	53	0.421	0.394	296	0.593	2317	0.623	0.608	**0.501**
Italy	40	0.418	15	0.294	60	0.434	0.382	324	0.602	5599	0.694	0.648	**0.515**
Jamaica	7	0.221	17	0.308	14	0.280	0.269	137	0.513	3308	0.652	0.582	**0.426**
Japan	18	0.328	208	0.580	34	0.374	0.427	438	0.634	5565	0.694	0.664	**0.545**
Jordan	15	0.307	5	0.175	20	0.317	0.266	212	0.558	2100	0.615	0.587	**0.427**
Kazakhstan	44	0.429	11	0.260	49	0.412	0.367	574	0.662	6000	0.700	0.681	**0.524**
Kenya	64	0.471	72	0.464	166	0.542	0.492	1203	0.739	6506	0.706	0.723	**0.608**
Kiribati	3	0.124	4	0.151	6	0.190	0.155	44	0.393	60	0.329	0.361	**0.258**
Korea, DPR	2	0.079	9	0.239	7	0.206	0.174	193	0.548	2898	0.641	0.595	**0.385**
Korea, Rep	5	0.182	171	0.558	9	0.233	0.324	161	0.530	2898	0.641	0.585	**0.455**
Kuwait	8	0.236	6	0.195	27	0.349	0.260	41	0.387	234	0.439	0.413	**0.336**
Kyrghyzstan	32	0.393	10	0.250	42	0.396	0.346	206	0.555	4500	0.677	0.616	**0.481**
Laos	87	0.506	76	0.470	97	0.485	0.487	659	0.676	8286	0.726	0.701	**0.594**
Latvia	12	0.282	7	0.211	35	0.377	0.290	300	0.594	1153	0.567	0.581	**0.435**
Lebanon	9	0.249	8	0.226	19	0.312	0.262	211	0.558	3000	0.644	0.601	**0.432**
Lesotho	5	0.182	8	0.226	13	0.272	0.227	91	0.470	1591	0.593	0.532	**0.379**
Liberia	30	0.385	33	0.380	47	0.408	0.391	565	0.660	2200	0.619	0.640	**0.515**
Libya	14	0.299	12	0.270	40	0.391	0.320	167	0.533	1825	0.604	0.569	**0.444**
Liechtenstein	4	0.157	5	0.175	6	0.190	0.174	188	0.546	1410	0.583	0.564	**0.369**
Lithuania	11	0.272	8	0.226	24	0.337	0.278	270	0.583	1796	0.603	0.593	**0.436**
Luxembourg	6	0.203	6	0.195	15	0.287	0.228	181	0.542	1246	0.573	0.558	**0.393**
Macedonia	9	0.249	6	0.195	24	0.337	0.260	288	0.590	3500	0.656	0.623	**0.442**
Madagascar	12	0.282	46	0.416	55	0.425	0.374	343	0.608	9505	0.737	0.673	**0.523**
Malawi	23	0.355	19	0.320	32	0.367	0.347	716	0.685	3765	0.662	0.674	**0.511**
Malaysia	146	0.565	123	0.522	174	0.547	0.545	801	0.697	15500	0.776	0.736	**0.640**
Maldives	3	0.124	6	0.195	9	0.233	0.184	26	0.340	583	0.512	0.426	**0.305**
Mali	45	0.431	23	0.340	45	0.403	0.392	534	0.654	1741	0.600	0.627	**0.510**
Malta	4	0.157	7	0.211	11	0.254	0.207	48	0.403	914	0.548	0.476	**0.342**
Marshall Islands	2	0.079	5	0.175	3	0.116	0.123	17	0.295	100	0.370	0.333	**0.228**
Martinique	5	0.182	12	0.270	9	0.233	0.228	61	0.428	1287	0.576	0.502	**0.365**
Mauritania	10	0.261	7	0.211	26	0.345	0.272	334	0.606	1100	0.563	0.584	**0.428**
Mauritius	13	0.291	11	0.260	24	0.337	0.296	31	0.358	750	0.532	0.445	**0.371**
Mayotte	4	0.157	4	0.151	10	0.244	0.184	45	0.397	500	0.500	0.449	**0.316**
Mexico	303	0.647	36	0.389	278	0.596	0.544	1260	0.744	26071	0.818	0.781	**0.663**
Micronesia	17	0.321	13	0.278	22	0.327	0.309	46	0.399	1194	0.570	0.484	**0.397**
Midway Islands	4	0.157					0.157		▯		▯	▯	▯
Moldova	12	0.282	7	0.211	32	0.367	0.287	245	0.573	1752	0.601	0.587	**0.437**
Monaco	3	0.124	5	0.175	15	0.287	0.195		▯		▯	▯	▯
Mongolia	14	0.299	18	0.314	21	0.323	0.312	559	0.659	2823	0.639	0.649	**0.480**
Montserrat	4	0.157	5	0.175	8	0.220	0.184	44	0.394	671	0.524	0.459	**0.321**
Morocco	12	0.282	10	0.250	32	0.367	0.300	315	0.599	3675	0.660	0.630	**0.465**
Mozambique	40	0.418	33	0.380	57	0.428	0.409	677	0.679	5692	0.695	0.687	**0.548**
Myanmar	113	0.536	89	0.487	133	0.518	0.514	1167	0.736	7000	0.712	0.724	**0.619**
Namibia	38	0.412	14	0.287	33	0.370	0.356	719	0.685	3174	0.649	0.667	**0.512**
Nauru	9	0.249	5	0.175	9	0.233	0.219	15	0.283	50	0.315	0.299	**0.259**
Nepal	123	0.545	78	0.473	118	0.505	0.508	792	0.696	6973	0.712	0.704	**0.606**
Netherlands	41	0.421	18	0.314	46	0.406	0.380	246	0.574	1221	0.572	0.573	**0.476**
Netherlands Antilles	8	0.236	11	0.260	15	0.287	0.261	129	0.506		▯	0.506	**0.384**
New Caledonia	43	0.426	10	0.250	50	0.414	0.364	118	0.497	3250	0.650	0.574	**0.469**
New Zealand	25	0.365	17	0.308	48	0.410	0.361	152	0.524	2382	0.625	0.574	**0.468**
Nicaragua	12	0.282	17	0.308	22	0.327	0.306	682	0.680	7590	0.719	0.699	**0.502**
Niger	20	0.339	8	0.226	37	0.383	0.316	430	0.632	1460	0.586	0.609	**0.462**
Nigeria	521	0.709	460	0.666	497	0.658	0.677	955	0.715	4715	0.680	0.698	**0.688**

Niue	2	0.079			4	0.147	0.113	16	0.289	178	0.417	0.353	**0.233**
Norfolk Island	1	0.000			6	0.190	0.095		▯		▯	▯	▯
Northern Cyprus		▯	3	0.119	4	0.147	0.133		▯		▯	▯	▯
Northern Mariana Islands	8	0.236	8	0.226	10	0.244	0.235	47	0.401	315	0.463	0.432	**0.333**
Norway	22	0.350	14	0.287	32	0.367	0.335	297	0.593	1715	0.599	0.596	**0.465**
Oman	19	0.334	11	0.260	26	0.345	0.313	163	0.531	1204	0.571	0.551	**0.432**
Pakistan	76	0.491	33	0.380	93	0.480	0.450	563	0.660	4950	0.684	0.672	**0.561**
Palau	6	0.203	7	0.211	5	0.170	0.195	47	0.401		▯	0.401	**0.298**
Palestine	8	0.236	7	0.211	21	0.323	0.256		▯		▯	▯	▯
Panama	19	0.334	22	0.336	33	0.370	0.347	950	0.714	9915	0.740	0.727	**0.537**
Papua New Guinea	833	0.762	648	0.703	862	0.716	0.727	858	0.704	11544	0.752	0.728	**0.728**
Paraguay	29	0.382	24	0.345	45	0.403	0.377	861	0.704	7851	0.721	0.713	**0.545**
Peru	108	0.531	67	0.457	111	0.499	0.495	1998	0.792	17144	0.784	0.788	**0.642**
Philippines	184	0.591	152	0.545	183	0.552	0.563	349	0.610	8931	0.732	0.671	**0.617**
Pitcairn	2	0.079			3	0.116	0.097	19	0.307	76	0.348	0.328	**0.213**
Poland	16	0.314	12	0.270	24	0.337	0.307	311	0.598	2450	0.628	0.613	**0.460**
Portugal	9	0.249	12	0.270	30	0.360	0.293	270	0.583	5050	0.686	0.635	**0.464**
Puerto Rico	14	0.299	13	0.278	12	0.263	0.280	121	0.500	2493	0.629	0.564	**0.422**
Qatar	7	0.221	7	0.211	21	0.323	0.251	34	0.367	355	0.472	0.420	**0.336**
Reunion	7	0.221	11	0.260	17	0.300	0.260	20	0.312	546	0.507	0.410	**0.335**
Romania	20	0.339	9	0.239	29	0.357	0.312	331	0.605	3400	0.654	0.629	**0.470**
Russia	119	0.542	67	0.457	169	0.543	0.514	897	0.709	11400	0.751	0.730	**0.622**
Rwanda	6	0.203	10	0.250	13	0.272	0.242	664	0.677	2288	0.622	0.650	**0.446**
Sahara, Western		▯	5	0.175	12	0.263	0.219	92	0.471	330	0.466	0.469	**0.344**
Saint Helena		▯	3	0.119	4	0.147	0.133	55	0.418	165	0.411	0.414	**0.274**
Saint Kitts & Nevis	2	0.079	7	0.211	6	0.190	0.160	39	0.382	659	0.522	0.452	**0.306**
Saint Lucia	2	0.079	8	0.226	7	0.206	0.170	59	0.425	1028	0.558	0.491	**0.331**
Saint Pierre & Miquelon	3	0.124	4	0.151	3	0.116	0.130		▯		▯	▯	▯
Saint Vincent / Grenadines	4	0.157	7	0.211	13	0.272	0.213	116	0.495	1166	0.568	0.532	**0.373**
Samoa, Western	2	0.079	5	0.175	8	0.220	0.158	43	0.392	737	0.531	0.462	**0.310**
San Marino	2	0.079	5	0.175	4	0.147	0.133	32	0.362		▯	0.362	**0.248**
Sao Tome e Principe	5	0.182	6	0.195	7	0.206	0.194	71	0.444	895	0.547	0.495	**0.345**
Saudi Arabia	21	0.345	13	0.278	39	0.388	0.337	232	0.568	2028	0.612	0.590	**0.464**
Senegal	41	0.421	32	0.376	58	0.430	0.409	576	0.662	2086	0.615	0.639	**0.524**
Seychelles	6	0.203	8	0.226	10	0.244	0.224	44	0.394	250	0.444	0.419	**0.322**
Sierra Leone	24	0.360	24	0.345	31	0.364	0.356	613	0.669	2090	0.615	0.642	**0.499**
Singapore	29	0.382	15	0.294	47	0.408	0.361	203	0.554	2282	0.622	0.588	**0.474**
Slovakia	12	0.282	7	0.211	19	0.312	0.268	294	0.592	3124	0.647	0.620	**0.444**
Slovenia	10	0.261	7	0.211	15	0.287	0.253	282	0.588	3200	0.649	0.619	**0.436**
Solomon Islands	75	0.489	72	0.464	76	0.459	0.471	216	0.560	3172	0.648	0.604	**0.538**
Somalia	13	0.291	9	0.239	29	0.357	0.295	593	0.665	3028	0.645	0.655	**0.475**
Somaliland		▯	6	0.195	11	0.254	0.224		▯		▯	▯	▯
South Africa	41	0.421	51	0.427	70	0.450	0.433	843	0.702	23420	0.809	0.756	**0.594**
Spain	23	0.355	8	0.226	36	0.380	0.320	360	0.613	5050	0.686	0.650	**0.485**
Spanish North Africa		▯	5	0.175	5	0.170	0.173		▯		▯	▯	▯
Sri Lanka	8	0.236	19	0.320	22	0.327	0.294	338	0.607	3314	0.652	0.629	**0.462**
Sudan	142	0.562	119	0.519	245	0.583	0.554	947	0.714	3137	0.648	0.681	**0.618**
Suriname	20	0.339	24	0.345	28	0.353	0.346	783	0.694	5018	0.685	0.690	**0.518**
Svalbard/Jan Mayen		▯			3	0.116	0.116		▯		▯	▯	▯
Swaziland	4	0.157	8	0.226	12	0.263	0.215	411	0.627	2715	0.636	0.632	**0.423**
Sweden	34	0.400	10	0.250	51	0.417	0.355	309	0.597	1750	0.601	0.599	**0.477**
Switzerland	26	0.369	12	0.270	39	0.388	0.342	268	0.583	3030	0.645	0.614	**0.478**
Syria	20	0.339	9	0.239	28	0.353	0.310	267	0.582	3000	0.644	0.613	**0.462**
Taiwan	35	0.403	29	0.366	30	0.360	0.376	223	0.563	3568	0.658	0.611	**0.493**

Tajikistan	33	0.396	9	0.239	41	0.393	0.343	208	0.556	5000	0.685	0.621	**0.482**
Tanzania	141	0.561	119	0.519	163	0.540	0.540	1138	0.733	10008	0.741	0.737	**0.638**
Thailand	84	0.502	49	0.423	95	0.482	0.469	881	0.707	11625	0.753	0.730	**0.599**
Timor Lorosae (East Timor)	19	0.334	23	0.340	22	0.327	0.334		▯		▯	▯	▯
Togo	46	0.434	30	0.369	53	0.421	0.408	587	0.664	3085	0.646	0.655	**0.532**
Tokelau	2	0.079			3	0.116	0.097	5	0.168	26	0.262	0.215	**0.156**
Tonga	7	0.221	6	0.195	10	0.244	0.220	39	0.382	463	0.494	0.438	**0.329**
Trinidad & Tobago	8	0.236	14	0.287	16	0.294	0.272	360	0.613	2259	0.621	0.617	**0.445**
Tunisia	10	0.261	6	0.195	25	0.341	0.265	251	0.576	2196	0.619	0.597	**0.431**
Turkey	47	0.436	16	0.301	57	0.428	0.389	418	0.629	8650	0.729	0.679	**0.534**
Turkmenistan	37	0.409	8	0.226	38	0.385	0.340	255	0.578		▯	0.578	**0.459**
Turks & Caicos Islands	2	0.079	5	0.175	5	0.170	0.141	70	0.443	448	0.491	0.467	**0.304**
Tuvalu	2	0.079	5	0.175	7	0.206	0.153	15	0.283		▯	0.283	**0.218**
Uganda	49	0.441	45	0.413	63	0.439	0.431	1175	0.737	4900	0.683	0.710	**0.571**
Ukraine	41	0.421	14	0.287	66	0.444	0.384	371	0.617	5100	0.687	0.652	**0.518**
United Arab Emirates	38	0.412	9	0.239	39	0.388	0.346	92	0.471		▯	0.471	**0.409**
United Kingdom	60	0.464	30	0.369	95	0.482	0.439	280	0.587	1623	0.595	0.591	**0.515**
United States of America	284	0.640	141	0.537	307	0.607	0.595	1078	0.728	19473	0.794	0.761	**0.678**
Uruguay	11	0.272	10	0.250	32	0.367	0.296	318	0.600	2278	0.622	0.611	**0.454**
US Virgin Islands	5	0.182	6	0.195	9	0.233	0.203	117	0.497		▯	0.497	**0.350**
Uzbekistan	41	0.421	11	0.260	64	0.441	0.374	240	0.571	4800	0.682	0.627	**0.500**
Vanuatu	117	0.540	63	0.450	123	0.510	0.500	87	0.465	870	0.544	0.505	**0.502**
Vatican State	3	0.124			4	0.147	0.136		▯		▯	▯	▯
Venezuela	49	0.441	36	0.389	70	0.450	0.427	1663	0.773	21073	0.801	0.787	**0.607**
Viet Nam	97	0.518	76	0.470	100	0.488	0.492	748	0.690	10500	0.745	0.717	**0.605**
Wake Island	1	0.000					0.000		▯		▯	▯	▯
Wallis & Futuna Islands	3	0.124	6	0.195	4	0.147	0.155	26	0.340	475	0.496	0.418	**0.286**
Yemen	13	0.291	13	0.278	22	0.327	0.299	209	0.557	1650	0.596	0.576	**0.438**
Yugoslavia	14	0.299	10	0.250	35	0.377	0.309	320	0.601	4082	0.669	0.635	**0.472**
Zambia	46	0.434	62	0.448	86	0.472	0.451	838	0.701	4747	0.681	0.691	**0.571**
Zimbabwe	22	0.350	25	0.349	42	0.396	0.365	802	0.697	4440	0.676	0.686	**0.526**

Table 2. IBCD-AREA, an areal biocultural diversity index.

Country or Territory	Area (km^2)	log A	Language diversity index, LD-AREA	Religion diversity index, RD-AREA	Ethnic Group diversity index, ED-AREA	Cultural Diversity Index, CD-AREA	Bird & mammal diversity index, MD-AREA	Plant diversity index, PD-AREA	Biodiversity Index, BD-AREA	Index of Biocultural Diversity, IBCD-AREA
WORLD/theoretical max value	136,605,342	**8.14**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
Afghanistan	652,225	5.81	0.551	0.193	0.454	0.399	0.532	0.503	0.517	0.458
Albania	28,748	4.46	0.418	0.185	0.318	0.307	0.731	0.649	0.690	0.498
Algeria	2,381,741	6.38	0.387	0.104	0.339	0.276	0.380	0.371	0.376	0.326
American Samoa	199	2.30	0.608	0.287	0.478	0.457	0.622	0.592	0.607	0.532
Andorra	468	2.67	0.547	0.287	0.459	0.431	0.897	0.751	0.824	0.628
Angola	1,246,700	6.10	0.503	0.345	0.408	0.419	0.737	0.514	0.625	0.522
Anguilla	91	1.96	0.491	0.337	0.407	0.412	0.355	0.564	0.460	0.436
Antigua & Barbuda	442	2.65	0.519	0.289	0.374	0.394	0.658	0.723	0.691	0.542
Argentina	2,780,400	6.44	0.465	0.266	0.387	0.373	0.712	0.582	0.647	0.510
Armenia	29,800	4.47	0.478	0.184	0.422	0.361	0.750	0.679	0.714	0.538
Aruba	193	2.29	0.554	0.390	0.428	0.457	0.778	0.589	0.683	0.570
Australia	7,682,300	6.89	0.701	0.380	0.454	0.512	0.563	0.621	0.592	0.552
Austria	83,858	4.92	0.516	0.265	0.471	0.417	0.647	0.584	0.616	0.516
Azerbaijan	86,600	4.94	0.595	0.129	0.430	0.385	0.683	0.648	0.665	0.525
Bahamas	13,939	4.14	0.402	0.184	0.303	0.297	0.530	0.491	0.510	0.403
Bahrain	694	2.84	0.625	0.335	0.479	0.480	0.572	0.331	0.451	0.466
Bangladesh	147,570	5.17	0.600	0.335	0.490	0.475	0.687	0.645	0.666	0.570
Barbados	430	2.63	0.425	0.365	0.463	0.418	0.513	0.581	0.547	0.482
Belarus	207,595	5.32	0.368	0.178	0.355	0.300	0.577	0.446	0.511	0.406
Belgium	30,528	4.48	0.600	0.286	0.465	0.450	0.674	0.508	0.591	0.521
Belize	22,965	4.36	0.522	0.259	0.392	0.391	0.862	0.654	0.758	0.574
Benin	112,680	5.05	0.639	0.421	0.493	0.518	0.746	0.521	0.633	0.576
Bermuda	54	1.73	0.418	0.376	0.475	0.423	0.436	0.465	0.450	0.437
Bhutan	47,000	4.67	0.601	0.250	0.416	0.422	0.862	0.737	0.799	0.611
Bolivia	1,098,581	6.04	0.524	0.332	0.408	0.421	0.731	0.768	0.750	0.585
Bosnia-Herzegovina	51,129	4.71	0.393	0.118	0.369	0.294	0.681		0.681	0.487
Botswana	581,730	5.76	0.518	0.347	0.421	0.429	0.645	0.384	0.514	0.471
Bougainville	10,050	4.00		0.455	0.511	0.483				
Brazil	8,547,404	6.93	0.663	0.494	0.525	0.561	0.729	0.875	0.802	0.681
British Indian Ocean Terr	60	1.78	0.414		0.423	0.418	0.577	0.355	0.466	0.442
British Virgin Islands	153	2.18	0.469	0.321	0.455	0.415				
Brunei	5,765	3.76	0.623	0.365	0.444	0.477	0.985	0.892	0.938	0.708
Bulgaria	110,994	5.05	0.482	0.144	0.421	0.349	0.645	0.595	0.620	0.484
Burkina Faso	274,400	5.44	0.631	0.429	0.506	0.522	0.671	0.296	0.483	0.503
Burundi	27,816	4.44	0.342	0.239	0.341	0.307	0.882	0.612	0.747	0.527
Cambodia	181,916	5.26	0.496	0.305	0.410	0.404	0.676		0.676	0.540
Cameroon	475,442	5.68	0.808	0.628	0.674	0.703	0.823	0.671	0.747	0.725
Canada	9,970,610	7.00	0.591	0.147	0.463	0.401	0.454	0.285	0.369	0.385
Cape Verde	4,033	3.61	0.330	0.222	0.314	0.288	0.426	0.498	0.462	0.375
Cayman Islands	259	2.41	0.541	0.328	0.394	0.421	0.686	0.602	0.644	0.533
Central African Republic	622,436	5.79	0.621	0.418	0.500	0.513	0.711	0.484	0.598	0.555
Chad	1,284,000	6.11	0.662	0.401	0.524	0.529	0.563	0.272	0.418	0.473

Channel Islands	194	2.29		0.357	0.405	0.381				
Chile	756,626	5.88	0.373	0.208	0.301	0.294	0.541	0.550	0.546	0.420
China	9,572,900	6.98	0.635	0.467	0.539	0.547	0.665	0.754	0.709	0.628
Christmas Island	135	2.13			0.460	0.460				
Cocos (Keeling) Islands	14	1.15			0.478	0.478				
Colombia	1,141,568	6.06	0.627	0.427	0.483	0.512	0.904	0.986	0.945	0.729
Comoros	1,862	3.27	0.534	0.219	0.408	0.387	0.572	0.533	0.552	0.470
Congo	342,000	5.53	0.620	0.429	0.496	0.515	0.725	0.627	0.676	0.595
Congo, Dem Rep	2,345,095	6.37	0.703	0.525	0.595	0.608	0.754	0.626	0.690	0.649
Cook Islands	233	2.37	0.601	0.206	0.440	0.416	0.544	0.478	0.511	0.463
Costa Rica	51,100	4.71	0.467	0.270	0.383	0.373	0.922	0.894	0.908	0.641
Cote d'Ivoire	322,463	5.51	0.668	0.466	0.536	0.556	0.768	0.530	0.649	0.603
Croatia	56,538	4.75	0.389	0.142	0.429	0.320	0.681	0.676	0.678	0.499
Cuba	110,861	5.04	0.284	0.257	0.299	0.280	0.492	0.717	0.605	0.442
Cyprus	9,251	3.97	0.445	0.197	0.334	0.325	0.561	0.602	0.582	0.453
Czech Republic	78,864	4.90	0.424	0.155	0.391	0.323	0.639	0.488	0.564	0.443
Denmark	43,094	4.63	0.505	0.225	0.429	0.387	0.648	0.472	0.560	0.473
Djibouti	23,200	4.37	0.381	0.142	0.299	0.274	0.638	0.397	0.518	0.396
Dominica	750	2.88	0.496	0.349	0.428	0.424	0.649	0.701	0.675	0.550
Dominican Republic	48,443	4.69	0.430	0.272	0.320	0.341	0.539	0.742	0.640	0.490
Ecuador	272,045	5.43	0.512	0.311	0.379	0.400	0.968	0.881	0.924	0.662
Egypt	997,739	6.00	0.417	0.157	0.350	0.308	0.418	0.341	0.380	0.344
El Salvador	21,041	4.32	0.465	0.297	0.361	0.375	0.816	0.661	0.739	0.557
Equatorial Guinea	28,051	4.45	0.504	0.239	0.412	0.385	0.834	0.664	0.749	0.567
Eritrea	117,400	5.07	0.495	0.195	0.306	0.332	0.710		0.710	0.521
Estonia	45,227	4.66	0.520	0.149	0.400	0.356	0.680	0.493	0.586	0.471
Ethiopia	1,133,882	6.05	0.608	0.490	0.538	0.546	0.710	0.569	0.640	0.593
Faeroe Islands	1,399	3.15	0.375	0.152	0.305	0.277	0.718	0.324	0.521	0.399
Falkland Is (Islas Malvinas)	12,173	4.09	0.188		0.250	0.219	0.435	0.111	0.273	0.246
Fiji	18,272	4.26	0.594	0.266	0.466	0.442	0.450	0.537	0.494	0.468
Finland	338,145	5.53	0.482	0.177	0.362	0.340	0.550	0.282	0.416	0.378
France	543,965	5.74	0.606	0.258	0.508	0.457	0.551	0.544	0.548	0.502
French Guiana	86,504	4.94	0.475	0.299	0.376	0.383	0.751	0.703	0.727	0.555
French Polynesia	4,000	3.60	0.563	0.265	0.424	0.417	0.505	0.542	0.523	0.470
Gabon	267,667	5.43	0.565	0.351	0.442	0.452	0.746	0.664	0.705	0.579
Gambia	10,689	4.03	0.623	0.282	0.496	0.467	0.875	0.481	0.678	0.573
Georgia	69,700	4.84	0.560	0.158	0.438	0.385	0.688	0.665	0.676	0.531
Germany	356,974	5.55	0.630	0.271	0.494	0.465	0.551	0.460	0.506	0.485
Ghana	238,533	5.38	0.668	0.491	0.554	0.571	0.787	0.553	0.670	0.621
Gibraltar	6	0.78	0.607	0.420	0.558	0.528	0.915	0.868	0.892	0.710
Greece	131,957	5.12	0.522	0.206	0.397	0.375	0.649	0.652	0.650	0.513
Greenland	2,175,600	6.34	0.062	0.004	0.030	0.032	0.060	0.012	0.036	0.034
Grenada	344	2.54	0.490	0.357	0.457	0.435	0.713	0.723	0.718	0.576
Guadaloupe	1,780	3.25	0.420	0.289	0.344	0.351	0.579	0.672	0.625	0.488
Guam	1,478	3.17	0.578	0.295	0.440	0.438	0.322	0.389	0.356	0.397
Guatemala	108,889	5.04	0.646	0.236	0.511	0.464	0.833	0.777	0.805	0.635
Guinea	245,857	5.39	0.569	0.259	0.424	0.417	0.731	0.507	0.619	0.518
Guinea-Bissau	36,125	4.56	0.577	0.326	0.450	0.451	0.752	0.408	0.580	0.515
Guyana	215,083	5.33	0.461	0.279	0.342	0.361	0.830	0.671	0.750	0.555
Haiti	27,700	4.44	0.303	0.253	0.278	0.278	0.465	0.763	0.614	0.446

Honduras	112,492	5.05	0.473	0.275	0.383	0.377	0.790	0.688	0.739	0.558
Hungary	93,033	4.97	0.518	0.187	0.367	0.357	0.633	0.508	0.571	0.464
Iceland	102,819	5.01	0.192	0.199	0.244	0.211	0.373	0.141	0.257	0.234
India	3,165,596	6.50	0.777	0.593	0.659	0.676	0.720	0.714	0.717	0.697
Indonesia	1,919,317	6.28	0.877	0.697	0.753	0.776	0.861	0.839	0.850	0.813
Iran	1,638,057	6.21	0.567	0.238	0.435	0.413	0.524	0.584	0.554	0.484
Iraq	435,052	5.64	0.497	0.155	0.374	0.342	0.484		0.484	0.413
Ireland	70,285	4.85	0.334	0.178	0.365	0.292	0.526	0.354	0.440	0.366
Isle of Man	572	2.76	0.413	0.222	0.339	0.324				
Israel	20,400	4.31	0.707	0.335	0.544	0.529	0.756	0.616	0.686	0.607
Italy	301,309	5.48	0.557	0.226	0.461	0.415	0.570	0.621	0.596	0.505
Jamaica	10,991	4.04	0.459	0.345	0.376	0.393	0.622	0.729	0.675	0.534
Japan	377,835	5.58	0.437	0.607	0.371	0.472	0.624	0.605	0.615	0.543
Jordan	89,246	4.95	0.474	0.101	0.349	0.308	0.564	0.500	0.532	0.420
Kazakhstan	2,717,300	6.43	0.476	0.114	0.349	0.313	0.536	0.493	0.514	0.414
Kenya	582,646	5.77	0.593	0.438	0.582	0.538	0.829	0.609	0.719	0.628
Kiribati	811	2.91	0.453	0.211	0.352	0.339	0.523	0.080	0.302	0.320
Korea, DPR	122,762	5.09	0.184	0.178	0.186	0.183	0.487	0.545	0.516	0.350
Korea, Rep	99,274	5.00	0.319	0.619	0.230	0.389	0.491	0.559	0.525	0.457
Kuwait	17,818	4.25	0.456	0.177	0.452	0.362	0.300	0.157	0.229	0.295
Kyrghyzstan	198,500	5.30	0.544	0.179	0.425	0.383	0.547	0.604	0.576	0.479
Laos	236,800	5.37	0.673	0.473	0.539	0.562	0.756	0.717	0.737	0.649
Latvia	64,610	4.81	0.457	0.161	0.441	0.353	0.671	0.399	0.535	0.444
Lebanon	10,230	4.01	0.496	0.236	0.422	0.385	0.729	0.714	0.722	0.553
Lesotho	30,355	4.48	0.369	0.203	0.327	0.300	0.447	0.514	0.481	0.390
Liberia	99,067	5.00	0.564	0.376	0.467	0.469	0.787	0.503	0.645	0.557
Libya	1,757,000	6.24	0.338	0.140	0.337	0.271	0.278	0.278	0.278	0.275
Liechtenstein	160	2.20	0.562	0.293	0.412	0.422	1.022	0.829	0.926	0.674
Lithuania	65,301	4.81	0.445	0.180	0.386	0.337	0.645	0.489	0.567	0.452
Luxembourg	2,586	3.41	0.499	0.236	0.440	0.391	0.799	0.624	0.711	0.551
Macedonia	25,713	4.41	0.457	0.166	0.421	0.348	0.732	0.685	0.709	0.528
Madagascar	587,041	5.77	0.363	0.371	0.423	0.386	0.533	0.686	0.609	0.498
Malawi	118,484	5.07	0.520	0.289	0.405	0.405	0.829	0.601	0.715	0.560
Malaysia	330,442	5.52	0.730	0.534	0.610	0.625	0.777	0.823	0.800	0.712
Maldives	298	2.47	0.496	0.301	0.447	0.415	0.508	0.609	0.558	0.487
Mali	1,248,574	6.10	0.512	0.246	0.366	0.375	0.579	0.291	0.435	0.405
Malta	316	2.50	0.533	0.322	0.474	0.443	0.648	0.697	0.672	0.558
Marshall Islands	181	2.26	0.462	0.289	0.308	0.353	0.446	0.282	0.364	0.358
Martinique	1,128	3.05	0.509	0.363	0.398	0.423	0.606	0.684	0.645	0.534
Mauritania	1,030,700	6.01	0.314	0.076	0.295	0.228	0.483	0.210	0.346	0.287
Mauritius	2,040	3.31	0.615	0.332	0.516	0.488	0.401	0.535	0.468	0.478
Mayotte	373	2.57	0.526	0.235	0.454	0.405	0.591	0.563	0.577	0.491
Mexico	1,958,201	6.29	0.754	0.299	0.611	0.555	0.747	0.814	0.780	0.667
Micronesia	701	2.85	0.697	0.389	0.544	0.543	0.576	0.700	0.638	0.591
Midway Islands	6	0.78	0.702			0.702				
Moldova	33,700	4.53	0.485	0.180	0.453	0.373	0.673	0.527	0.600	0.486
Monaco	2	0.30	0.709	0.426	0.708	0.614				
Mongolia	1,566,500	6.19	0.343	0.203	0.248	0.265	0.572	0.375	0.474	0.369
Montserrat	102	2.01	0.581	0.307	0.471	0.453	0.714	0.707	0.711	0.582
Morocco	458,730	5.66	0.374	0.154	0.355	0.294	0.531	0.508	0.520	0.407

Mozambique	812,379	5.91	0.514	0.312	0.416	0.414	0.668	0.560	0.614	0.514
Myanmar	676,577	5.83	0.664	0.464	0.545	0.558	0.811	0.614	0.712	0.635
Namibia	825,118	5.92	0.507	0.185	0.337	0.343	0.681	0.440	0.561	0.452
Nauru	21	1.32	0.759	0.355	0.547	0.554	0.554	0.280	0.417	0.485
Nepal	147,181	5.17	0.741	0.491	0.585	0.606	0.836	0.713	0.775	0.690
Netherlands	41,526	4.62	0.644	0.313	0.497	0.485	0.658	0.439	0.549	0.517
Netherlands Antilles	800	2.90	0.588	0.361	0.484	0.478	0.780		0.780	0.629
New Caledonia	18,576	4.27	0.685	0.251	0.539	0.492	0.546	0.691	0.619	0.555
New Zealand	270,534	5.43	0.497	0.248	0.433	0.393	0.400	0.454	0.427	0.410
Nicaragua	131,670	5.12	0.427	0.270	0.348	0.348	0.810	0.737	0.773	0.561
Niger	1,287,000	6.11	0.400	0.089	0.337	0.275	0.525	0.253	0.389	0.332
Nigeria	923,768	5.97	0.861	0.697	0.723	0.760	0.739	0.514	0.626	0.693
Niue	260	2.41	0.446		0.336	0.391	0.403	0.376	0.390	0.390
Norfolk Island	40	1.60	0.431		0.464	0.448				
Northern Cyprus	3,335	3.52		0.126	0.240	0.183				
Northern Mariana Islands	477	2.68	0.610	0.329	0.445	0.462	0.581	0.453	0.517	0.489
Norway	323,878	5.51	0.472	0.214	0.368	0.351	0.544	0.375	0.460	0.405
Oman	309,500	5.49	0.453	0.180	0.340	0.324	0.406	0.306	0.356	0.340
Pakistan	796,095	5.90	0.603	0.313	0.487	0.468	0.626	0.533	0.580	0.524
Palau	1,632	3.21	0.519	0.272	0.299	0.363	0.516	-	0.516	0.440
Palestine	6,242	3.80	0.501	0.232	0.455	0.396				
Panama	75,517	4.88	0.513	0.325	0.427	0.422	0.931	0.828	0.879	0.650
Papua New Guinea	462,840	5.67	0.954	0.769	0.828	0.850	0.767	0.741	0.754	0.802
Paraguay	406,752	5.61	0.500	0.287	0.408	0.398	0.778	0.671	0.724	0.561
Peru	1,285,216	6.11	0.631	0.403	0.495	0.510	0.888	0.755	0.822	0.666
Philippines	300,076	5.48	0.766	0.568	0.621	0.652	0.588	0.717	0.653	0.652
Pitcairn	4	0.60	0.624		0.451	0.537	0.765	0.473	0.619	0.578
Poland	312,685	5.50	0.429	0.192	0.328	0.316	0.558	0.450	0.504	0.410
Portugal	92,135	4.96	0.403	0.229	0.406	0.346	0.619	0.677	0.648	0.497
Puerto Rico	9,104	3.96	0.562	0.311	0.361	0.411	0.607	0.683	0.645	0.528
Qatar	11,427	4.06	0.457	0.213	0.433	0.368	0.290	0.271	0.281	0.324
Reunion	2,512	3.40	0.521	0.326	0.459	0.435	0.282	0.457	0.369	0.402
Romania	237,500	5.38	0.472	0.158	0.365	0.332	0.594	0.535	0.564	0.448
Russia	17,075,400	7.23	0.534	0.325	0.458	0.439	0.500	0.504	0.502	0.471
Rwanda	26,338	4.42	0.400	0.240	0.332	0.324	0.927	0.597	0.762	0.543
Sahara, Western	266,769	5.43		0.068	0.234	0.151	0.283	0.052	0.167	0.159
Saint Helena	122	2.09		0.226	0.364	0.295	0.753	0.409	0.581	0.438
Saint Kitts & Nevis	269	2.43	0.445	0.327	0.393	0.388	0.611	0.641	0.626	0.507
Saint Lucia	617	2.79	0.409	0.322	0.384	0.372	0.645	0.677	0.661	0.516
Saint Pierre & Miquelon	242	2.38	0.505	0.248	0.297	0.350				
Saint Vincent / Grenadines	389	2.59	0.524	0.316	0.490	0.443	0.840	0.733	0.786	0.615
Samoa, Western	2,826	3.45	0.345	0.206	0.346	0.299	0.453	0.511	0.482	0.390
San Marino	61	1.79	0.508	0.322	0.390	0.407	0.732		0.732	0.569
Sao Tome e Principe	1,001	3.00	0.514	0.264	0.366	0.382	0.651	0.618	0.635	0.508
Saudi Arabia	2,248,000	6.35	0.383	0.144	0.324	0.283	0.337	0.284	0.310	0.297
Senegal	196,712	5.29	0.578	0.351	0.472	0.467	0.739	0.448	0.593	0.530
Seychelles	455	2.66	0.573	0.331	0.447	0.450	0.599	0.409	0.504	0.477
Sierra Leone	71,740	4.86	0.548	0.339	0.420	0.435	0.831	0.514	0.672	0.554
Singapore	641	2.81	0.774	0.413	0.656	0.615	0.933	0.837	0.885	0.750
Slovakia	49,035	4.69	0.469	0.169	0.364	0.334	0.687	0.620	0.654	0.494

Slovenia	20,256	4.31	0.481	0.196	0.363	0.347	0.745	0.682	0.714	0.530
Solomon Islands	28,370	4.45	0.743	0.529	0.583	0.619	0.657	0.659	0.658	0.638
Somalia	497,000	5.70	0.381	0.136	0.338	0.285	0.675	0.464	0.569	0.427
Somaliland	140,000	5.15		0.114	0.246	0.180				
South Africa	1,223,201	6.09	0.500	0.364	0.431	0.432	0.688	0.822	0.755	0.593
Spain	504,783	5.70	0.459	0.118	0.368	0.315	0.556	0.567	0.561	0.438
Spanish North Africa	33	1.52		0.341	0.445	0.393				
Sri Lanka	65,610	4.82	0.401	0.307	0.374	0.361	0.698	0.613	0.655	0.508
Sudan	2,503,890	6.40	0.640	0.468	0.584	0.564	0.661	0.366	0.513	0.538
Suriname	163,820	5.21	0.487	0.314	0.374	0.392	0.825	0.639	0.732	0.562
Svalbard/Jan Mayen	62,160	4.79			0.089	0.089				
Swaziland	17,364	4.24	0.362	0.220	0.336	0.306	0.846	0.659	0.752	0.529
Sweden	449,964	5.65	0.517	0.154	0.422	0.365	0.528	0.358	0.443	0.404
Switzerland	41,284	4.62	0.582	0.254	0.473	0.436	0.679	0.625	0.652	0.544
Syria	185,180	5.27	0.482	0.166	0.370	0.339	0.562	0.526	0.544	0.442
Taiwan	36,179	4.56	0.628	0.388	0.441	0.486	0.645	0.667	0.656	0.571
Tajikistan	143,100	5.16	0.562	0.173	0.434	0.390	0.575	0.647	0.611	0.500
Tanzania	942,799	5.97	0.681	0.497	0.562	0.580	0.779	0.666	0.722	0.651
Thailand	513,115	5.71	0.636	0.385	0.507	0.509	0.765	0.736	0.751	0.630
Timor Lorosae (East Timor)	14,874	4.17	0.583	0.381	0.429	0.464				
Togo	56,785	4.75	0.647	0.379	0.506	0.510	0.839	0.608	0.724	0.617
Tokelau	10	1.00	0.585		0.417	0.501	0.380	0.195	0.287	0.394
Tonga	750	2.88	0.573	0.273	0.428	0.425	0.532	0.502	0.517	0.471
Trinidad & Tobago	5,128	3.71	0.509	0.340	0.424	0.424	0.909	0.701	0.805	0.614
Tunisia	164,150	5.22	0.392	0.109	0.358	0.287	0.557	0.470	0.513	0.400
Turkey	779,452	5.89	0.538	0.207	0.418	0.388	0.557	0.648	0.603	0.495
Turkmenistan	488,100	5.69	0.525	0.119	0.377	0.340	0.529		0.529	0.435
Turks & Caicos Islands	497	2.70	0.419	0.259	0.344	0.340	0.674	0.522	0.598	0.469
Tuvalu	24	1.38	0.548	0.351	0.506	0.468	0.543		0.543	0.506
Uganda	241,040	5.38	0.594	0.395	0.476	0.488	0.892	0.609	0.750	0.619
Ukraine	603,700	5.78	0.530	0.195	0.449	0.391	0.549	0.557	0.553	0.472
United Arab Emirates	83,600	4.92	0.604	0.190	0.447	0.414	0.372		0.372	0.393
United Kingdom	244,110	5.39	0.621	0.335	0.535	0.497	0.552	0.383	0.467	0.482
United States of America	9,529,063	6.98	0.678	0.452	0.566	0.565	0.588	0.652	0.620	0.593
Uruguay	176,215	5.25	0.402	0.183	0.391	0.325	0.607	0.473	0.540	0.433
US Virgin Islands	352	2.55	0.559	0.296	0.441	0.432	0.821		0.821	0.626
Uzbekistan	447,400	5.65	0.543	0.168	0.455	0.389	0.521	0.564	0.543	0.466
Vanuatu	12,190	4.09	0.840	0.535	0.684	0.687	0.507	0.450	0.478	0.582
Vatican State	1	-	0.738		0.544	0.641				
Venezuela	912,050	5.96	0.537	0.322	0.442	0.434	0.871	0.820	0.845	0.639
Viet Nam	331,041	5.52	0.674	0.463	0.531	0.556	0.761	0.744	0.752	0.654
Wake Island	7	0.85	0.505			0.505				
Wallis & Futuna Islands	240	2.38	0.505	0.308	0.339	0.384	0.524	0.581	0.553	0.468
Yemen	472,099	5.67	0.383	0.192	0.300	0.292	0.432	0.343	0.388	0.340
Yugoslavia	102,173	5.01	0.459	0.199	0.424	0.361	0.651	0.627	0.639	0.500
Zambia	752,614	5.88	0.537	0.408	0.478	0.474	0.724	0.528	0.626	0.550
Zimbabwe	390,757	5.59	0.464	0.294	0.400	0.386	0.764	0.557	0.661	0.523
theoretical minimum value	1,000	**3.00**	-	-	-	-	-	-	-	-

Table 3. IBCD-POP, a per capita biocultural diversity index.

Country or Territory	Population 2000 (thousand)	Language diversity index, LD-POP	Religion diversity index, RD-POP	Ethnic Group diversity index, ED-POP	Cultural Diversity Index, CD-POP	Bird & mammal diversity index, MD-POP	Plant diversity index, PD-POP	Biodiversity Index, BD-POP	Index of Biocultural Diversity, IBCD-POP
WORLD/theoretical max value	6,056,710	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Afghanistan	21,765	0.513	0.264	0.489	0.422	0.503	0.484	0.493	0.458
Albania	3,134	0.337	0.239	0.316	0.297	0.608	0.572	0.590	0.444
Algeria	30,291	0.381	0.202	0.405	0.329	0.435	0.414	0.424	0.377
American Samoa	68	0.516	0.340	0.464	0.440	0.461	0.495	0.478	0.459
Andorra	86	0.478	0.358	0.468	0.434	0.738	0.680	0.709	0.572
Angola	13,134	0.517	0.454	0.489	0.486	0.759	0.571	0.665	0.576
Anguilla	11	0.455	0.438	0.445	0.446	0.310	0.554	0.432	0.439
Antigua & Barbuda	65	0.461	0.369	0.391	0.407	0.548	0.671	0.609	0.508
Argentina	37,032	0.459	0.359	0.451	0.423	0.716	0.608	0.662	0.543
Armenia	3,787	0.392	0.231	0.416	0.346	0.613	0.589	0.601	0.474
Aruba	101	0.438	0.426	0.393	0.419	0.565	0.461	0.513	0.466
Australia	19,138	0.784	0.528	0.590	0.634	0.703	0.755	0.729	0.681
Austria	8,080	0.437	0.313	0.472	0.407	0.538	0.507	0.523	0.465
Azerbaijan	8,041	0.521	0.179	0.431	0.377	0.571	0.570	0.571	0.474
Bahamas	304	0.412	0.308	0.380	0.367	0.555	0.550	0.552	0.459
Bahrain	640	0.471	0.338	0.412	0.407	0.338	0.161	0.250	0.328
Bangladesh	137,439	0.401	0.287	0.384	0.357	0.405	0.392	0.398	0.378
Barbados	267	0.288	0.387	0.416	0.364	0.319	0.432	0.375	0.370
Belarus	10,187	0.311	0.244	0.377	0.311	0.521	0.415	0.468	0.389
Belgium	10,249	0.467	0.293	0.416	0.392	0.477	0.357	0.417	0.404
Belize	226	0.573	0.408	0.505	0.495	0.896	0.756	0.826	0.660
Benin	6,272	0.591	0.486	0.518	0.532	0.661	0.484	0.573	0.552
Bermuda	63	0.265	0.392	0.415	0.358	0.219	0.301	0.260	0.309
Bhutan	2,085	0.570	0.333	0.455	0.453	0.783	0.715	0.749	0.601
Bolivia	8,329	0.557	0.454	0.505	0.505	0.779	0.836	0.808	0.656
Bosnia-Herzegovina	3,977	0.325	0.180	0.381	0.295	0.586		0.586	0.440
Botswana	1,541	0.611	0.517	0.571	0.566	0.784	0.558	0.671	0.619
Bougainville	198		0.582	0.601	0.591				
Brazil	170,406	0.634	0.557	0.567	0.586	0.695	0.841	0.768	0.677
British Indian Ocean Terr	3	0.434		0.513	0.474	0.581	0.440	0.511	0.492
British Virgin Islands	24	0.414	0.408	0.479	0.434				
Brunei	328	0.597	0.457	0.487	0.514	0.883	0.869	0.876	0.695
Bulgaria	7,949	0.415	0.202	0.432	0.350	0.556	0.536	0.546	0.448
Burkina Faso	11,535	0.590	0.496	0.537	0.541	0.612	0.282	0.447	0.494
Burundi	6,356	0.221	0.263	0.306	0.263	0.685	0.483	0.584	0.424
Cambodia	13,104	0.425	0.356	0.417	0.399	0.579		0.579	0.489
Cameroon	14,876	0.784	0.699	0.720	0.734	0.761	0.651	0.706	0.720
Canada	30,757	0.656	0.287	0.588	0.510	0.592	0.420	0.506	0.508
Cape Verde	427	0.264	0.295	0.327	0.295	0.358	0.456	0.407	0.351
Cayman Islands	38	0.489	0.412	0.415	0.439	0.576	0.563	0.569	0.504
Central African Republic	3,717	0.675	0.555	0.615	0.615	0.783	0.593	0.688	0.651
Chad	7,885	0.710	0.529	0.633	0.624	0.649	0.382	0.515	0.570
Channel Islands	153		0.377	0.352	0.364				

Chile	15,211	0.353	0.297	0.352	0.334	0.547	0.563	0.555	0.445
China	1,282,437	0.504	0.455	0.493	0.484	0.502	0.586	0.544	0.514
Christmas Island	1			0.625	0.625				
Cocos (Keeling) Islands	1			0.555	0.555				
Colombia	42,105	0.581	0.486	0.510	0.526	0.813	0.926	0.869	0.697
Comoros	706	0.415	0.248	0.371	0.345	0.396	0.405	0.401	0.373
Congo	3,018	0.658	0.556	0.597	0.604	0.769	0.706	0.738	0.671
Congo, Dem Rep	50,948	0.682	0.597	0.644	0.641	0.719	0.616	0.667	0.654
Cook Islands	20	0.580	0.314	0.487	0.460	0.492	0.487	0.490	0.475
Costa Rica	4,024	0.401	0.330	0.394	0.375	0.792	0.820	0.806	0.591
Cote d'Ivoire	16,013	0.618	0.524	0.560	0.567	0.682	0.489	0.586	0.577
Croatia	4,654	0.317	0.201	0.438	0.319	0.581	0.610	0.595	0.457
Cuba	11,199	0.191	0.300	0.291	0.261	0.400	0.626	0.513	0.387
Cyprus	784	0.388	0.271	0.352	0.337	0.486	0.560	0.523	0.430
Czech Republic	10,272	0.326	0.192	0.376	0.298	0.510	0.396	0.453	0.375
Denmark	5,320	0.418	0.270	0.422	0.370	0.525	0.392	0.458	0.414
Djibouti	632	0.373	0.253	0.362	0.329	0.629	0.439	0.534	0.432
Dominica	71	0.456	0.440	0.462	0.453	0.569	0.676	0.622	0.537
Dominican Republic	8,373	0.322	0.301	0.294	0.305	0.406	0.620	0.513	0.409
Ecuador	12,646	0.461	0.375	0.402	0.413	0.861	0.827	0.844	0.628
Egypt	67,884	0.333	0.196	0.346	0.292	0.351	0.274	0.313	0.302
El Salvador	6,278	0.337	0.312	0.317	0.322	0.611	0.514	0.562	0.442
Equatorial Guinea	457	0.526	0.366	0.501	0.464	0.834	0.726	0.780	0.622
Eritrea	3,659	0.471	0.285	0.351	0.369	0.672		0.672	0.521
Estonia	1,393	0.506	0.248	0.456	0.403	0.653	0.512	0.582	0.493
Ethiopia	62,908	0.540	0.532	0.548	0.540	0.617	0.502	0.560	0.550
Faeroe Islands	46	0.380	0.281	0.380	0.347	0.701	0.390	0.546	0.446
Falkland Is (Islas Malvinas)	2	0.446		0.550	0.498	0.827	0.551	0.689	0.593
Fiji	814	0.571	0.358	0.514	0.481	0.433	0.538	0.485	0.483
Finland	5,172	0.486	0.285	0.434	0.402	0.579	0.341	0.460	0.431
France	59,238	0.509	0.283	0.491	0.428	0.435	0.439	0.437	0.432
French Guiana	165	0.600	0.500	0.554	0.551	0.911	0.906	0.909	0.730
French Polynesia	233	0.538	0.360	0.468	0.455	0.470	0.541	0.506	0.480
Gabon	1,230	0.638	0.506	0.573	0.572	0.836	0.792	0.814	0.693
Gambia	1,303	0.552	0.339	0.502	0.464	0.730	0.418	0.574	0.519
Georgia	5,262	0.497	0.218	0.451	0.389	0.592	0.604	0.598	0.493
Germany	82,017	0.498	0.270	0.446	0.405	0.384	0.310	0.347	0.376
Ghana	19,306	0.595	0.533	0.558	0.562	0.665	0.479	0.572	0.567
Gibraltar	27	0.408	0.403	0.454	0.422	0.548	0.609	0.578	0.500
Greece	10,610	0.449	0.257	0.401	0.369	0.551	0.579	0.565	0.467
Greenland	56	0.370	0.348	0.371	0.363	0.607	0.531	0.569	0.466
Grenada	94	0.400	0.413	0.450	0.421	0.552	0.628	0.590	0.506
Guadaloupe	428	0.321	0.336	0.327	0.328	0.436	0.569	0.503	0.415
Guam	155	0.530	0.376	0.466	0.457	0.276	0.366	0.321	0.389
Guatemala	11,385	0.565	0.278	0.507	0.450	0.691	0.680	0.686	0.568
Guinea	8,154	0.539	0.339	0.465	0.447	0.681	0.500	0.591	0.519
Guinea-Bissau	1,199	0.563	0.422	0.505	0.497	0.711	0.429	0.570	0.533
Guyana	761	0.546	0.447	0.484	0.492	0.929	0.820	0.874	0.683
Haiti	8,142	0.167	0.267	0.230	0.221	0.307	0.608	0.457	0.339
Honduras	6,417	0.417	0.340	0.403	0.387	0.697	0.640	0.669	0.528

Hungary	9,968	0.433	0.230	0.359	0.341	0.518	0.427	0.472	0.407
Iceland	279	0.286	0.386	0.400	0.357	0.559	0.348	0.454	0.405
India	1,008,937	0.615	0.556	0.585	0.585	0.493	0.499	0.496	0.541
Indonesia	212,092	0.779	0.705	0.734	0.739	0.695	0.700	0.697	0.718
Iran	70,330	0.508	0.290	0.451	0.416	0.473	0.531	0.502	0.459
Iraq	22,946	0.435	0.212	0.388	0.345	0.431		0.431	0.388
Ireland	3,803	0.279	0.251	0.390	0.307	0.476	0.335	0.406	0.356
Isle of Man	79	0.352	0.302	0.355	0.336				
Israel	6,040	0.588	0.351	0.506	0.482	0.559	0.473	0.516	0.499
Italy	57,530	0.433	0.235	0.421	0.363	0.415	0.477	0.446	0.405
Jamaica	2,576	0.348	0.376	0.348	0.357	0.464	0.603	0.534	0.445
Japan	127,096	0.278	0.587	0.301	0.389	0.419	0.418	0.419	0.404
Jordan	4,913	0.422	0.172	0.371	0.322	0.506	0.469	0.488	0.405
Kazakhstan	16,172	0.513	0.240	0.449	0.401	0.623	0.583	0.603	0.502
Kenya	30,669	0.533	0.489	0.601	0.541	0.727	0.552	0.640	0.590
Kiribati	83	0.407	0.300	0.380	0.362	0.454	0.084	0.269	0.316
Korea, DPR	22,268	0.057	0.198	0.146	0.134	0.352	0.420	0.386	0.260
Korea, Rep	46,740	0.148	0.598	0.149	0.299	0.288	0.366	0.327	0.313
Kuwait	1,914	0.382	0.236	0.459	0.359	0.240	0.116	0.178	0.268
Kyrghyzstan	4,921	0.530	0.273	0.481	0.428	0.545	0.615	0.580	0.504
Laos	5,279	0.668	0.566	0.602	0.612	0.732	0.727	0.730	0.671
Latvia	2,421	0.427	0.249	0.486	0.388	0.628	0.405	0.517	0.452
Lebanon	3,496	0.367	0.254	0.379	0.333	0.530	0.562	0.546	0.440
Lesotho	2,035	0.312	0.275	0.348	0.312	0.398	0.480	0.439	0.375
Liberia	2,913	0.548	0.468	0.522	0.512	0.744	0.516	0.630	0.571
Libya	5,290	0.408	0.297	0.470	0.392	0.453	0.436	0.444	0.418
Liechtenstein	33	0.496	0.369	0.422	0.429	0.844	0.758	0.801	0.615
Lithuania	3,696	0.393	0.252	0.411	0.352	0.576	0.460	0.518	0.435
Luxembourg	437	0.419	0.294	0.439	0.384	0.649	0.545	0.597	0.491
Macedonia	2,034	0.396	0.233	0.438	0.356	0.633	0.631	0.632	0.494
Madagascar	15,970	0.329	0.449	0.467	0.415	0.519	0.673	0.596	0.505
Malawi	11,308	0.439	0.334	0.402	0.392	0.694	0.520	0.607	0.499
Malaysia	22,218	0.667	0.579	0.623	0.623	0.668	0.743	0.705	0.664
Maldives	291	0.341	0.310	0.382	0.344	0.284	0.429	0.356	0.350
Mali	11,351	0.535	0.361	0.453	0.450	0.634	0.371	0.503	0.476
Malta	390	0.367	0.321	0.399	0.362	0.387	0.494	0.441	0.401
Marshall Islands	51	0.375	0.352	0.299	0.342	0.323	0.218	0.270	0.306
Martinique	383	0.400	0.400	0.370	0.390	0.437	0.561	0.499	0.444
Mauritania	2,665	0.397	0.245	0.438	0.360	0.643	0.389	0.516	0.438
Mauritius	1,161	0.477	0.344	0.464	0.428	0.219	0.376	0.298	0.363
Mayotte	102	0.437	0.292	0.446	0.392	0.447	0.476	0.462	0.427
Mexico	98,872	0.692	0.342	0.624	0.553	0.652	0.733	0.693	0.623
Micronesia	123	0.633	0.456	0.554	0.548	0.462	0.630	0.546	0.547
Midway Islands	-	0.679			0.679				
Moldova	4,295	0.397	0.226	0.447	0.357	0.546	0.444	0.495	0.426
Monaco	33	0.455	0.369	0.558	0.460				
Mongolia	2,533	0.447	0.385	0.409	0.413	0.752	0.574	0.663	0.538
Montserrat	4	0.606	0.452	0.561	0.540	0.701	0.770	0.735	0.637
Morocco	29,878	0.296	0.202	0.358	0.285	0.457	0.444	0.450	0.368
Mozambique	18,292	0.493	0.395	0.466	0.451	0.648	0.564	0.606	0.529

Myanmar	47,749	0.590	0.502	0.548	0.547	0.689	0.534	0.612	0.579
Namibia	1,757	0.608	0.362	0.492	0.488	0.829	0.623	0.726	0.607
Nauru	12	0.664	0.408	0.528	0.534	0.378	0.190	0.284	0.409
Nepal	23,043	0.640	0.512	0.563	0.572	0.663	0.586	0.625	0.598
Netherlands	15,864	0.504	0.313	0.441	0.419	0.452	0.279	0.365	0.392
Netherlands Antilles	215	0.497	0.410	0.472	0.459	0.606		0.606	0.533
New Caledonia	215	0.736	0.396	0.650	0.594	0.613	0.782	0.697	0.646
New Zealand	3,778	0.509	0.361	0.513	0.461	0.458	0.512	0.485	0.473
Nicaragua	5,071	0.389	0.349	0.384	0.374	0.742	0.713	0.728	0.551
Niger	10,832	0.422	0.209	0.426	0.352	0.593	0.341	0.467	0.410
Nigeria	113,862	0.762	0.707	0.703	0.724	0.586	0.394	0.490	0.607
Niue	2	0.544		0.490	0.517	0.545	0.565	0.555	0.536
Norfolk Island	2	0.446		0.550	0.498				
Northern Cyprus	185		0.226	0.283	0.255				
Northern Mariana Islands	73	0.553	0.406	0.461	0.473	0.478	0.412	0.445	0.459
Norway	4,469	0.482	0.326	0.445	0.417	0.582	0.437	0.509	0.463
Oman	2,538	0.490	0.313	0.440	0.414	0.501	0.410	0.455	0.435
Pakistan	141,256	0.477	0.315	0.445	0.412	0.463	0.388	0.425	0.419
Palau	19	0.583	0.439	0.420	0.481	0.601		0.601	0.541
Palestine	2,215	0.374	0.252	0.415	0.347				
Panama	2,856	0.484	0.409	0.470	0.455	0.851	0.807	0.829	0.642
Papua New Guinea	4,809	0.994	0.882	0.930	0.935	0.793	0.798	0.795	0.865
Paraguay	5,496	0.510	0.396	0.486	0.464	0.784	0.714	0.749	0.606
Peru	25,662	0.616	0.485	0.549	0.550	0.844	0.751	0.797	0.674
Philippines	75,653	0.635	0.562	0.574	0.590	0.410	0.547	0.479	0.535
Pitcairn	0	0.740		0.619	0.680	0.851	0.676	0.764	0.722
Poland	38,605	0.323	0.219	0.304	0.282	0.435	0.348	0.392	0.337
Portugal	10,016	0.312	0.272	0.398	0.327	0.504	0.585	0.545	0.436
Puerto Rico	3,915	0.424	0.320	0.306	0.350	0.409	0.518	0.464	0.407
Qatar	565	0.427	0.306	0.477	0.403	0.290	0.285	0.288	0.346
Reunion	721	0.414	0.362	0.435	0.404	0.165	0.350	0.257	0.331
Romania	22,438	0.384	0.198	0.357	0.313	0.487	0.450	0.469	0.391
Russia	145,491	0.539	0.417	0.532	0.496	0.555	0.546	0.551	0.523
Rwanda	7,609	0.269	0.256	0.287	0.271	0.707	0.453	0.580	0.425
Sahara, Western	252		0.289	0.431	0.360	0.551	0.330	0.441	0.400
Saint Helena	6		0.361	0.440	0.401	0.717	0.471	0.594	0.497
Saint Kitts & Nevis	38	0.390	0.412	0.415	0.406	0.513	0.602	0.557	0.482
Saint Lucia	148	0.319	0.378	0.376	0.358	0.499	0.588	0.543	0.451
Saint Pierre & Miquelon	7	0.536	0.397	0.390	0.441				
Saint Vincent / Grenadines	113	0.432	0.369	0.480	0.427	0.656	0.632	0.644	0.535
Samoa, Western	159	0.315	0.307	0.392	0.338	0.430	0.518	0.474	0.406
San Marino	27	0.408	0.377	0.371	0.385	0.544		0.544	0.465
Sao Tome e Principe	138	0.453	0.339	0.379	0.390	0.542	0.566	0.554	0.472
Saudi Arabia	20,346	0.396	0.255	0.405	0.352	0.422	0.358	0.390	0.371
Senegal	9,421	0.531	0.417	0.499	0.482	0.663	0.420	0.541	0.512
Seychelles	80	0.507	0.402	0.457	0.456	0.484	0.361	0.422	0.439
Sierra Leone	4,405	0.495	0.405	0.441	0.447	0.730	0.476	0.603	0.525
Singapore	4,018	0.526	0.340	0.507	0.458	0.512	0.499	0.506	0.482
Slovakia	5,399	0.385	0.217	0.359	0.321	0.566	0.538	0.552	0.436
Slovenia	1,988	0.412	0.257	0.370	0.346	0.630	0.616	0.623	0.485

Solomon Islands	447	0.776	0.655	0.679	0.703	0.684	0.723	0.703	0.703
Somalia	8,778	0.371	0.235	0.400	0.335	0.674	0.497	0.585	0.460
Somaliland	2,833		0.220	0.308	0.264				
South Africa	43,309	0.451	0.425	0.457	0.444	0.630	0.773	0.702	0.573
Spain	39,910	0.373	0.158	0.362	0.298	0.463	0.484	0.474	0.386
Spanish North Africa	130		0.315	0.332	0.323				
Sri Lanka	18,924	0.262	0.314	0.323	0.300	0.504	0.458	0.481	0.390
Sudan	31,095	0.645	0.561	0.658	0.621	0.678	0.411	0.544	0.583
Suriname	417	0.592	0.498	0.534	0.541	0.951	0.817	0.884	0.712
Svalbard/Jan Mayen	4			0.416	0.416				
Swaziland	925	0.322	0.306	0.372	0.333	0.762	0.640	0.701	0.517
Sweden	8,842	0.508	0.250	0.483	0.413	0.541	0.391	0.466	0.440
Switzerland	7,170	0.481	0.285	0.453	0.406	0.527	0.512	0.519	0.463
Syria	16,189	0.401	0.211	0.366	0.326	0.467	0.450	0.459	0.392
Taiwan	22,401	0.463	0.369	0.362	0.398	0.407	0.460	0.433	0.416
Tajikistan	6,087	0.523	0.249	0.468	0.413	0.532	0.620	0.576	0.495
Tanzania	35,119	0.638	0.557	0.592	0.595	0.706	0.625	0.666	0.631
Thailand	62,806	0.534	0.404	0.485	0.474	0.612	0.611	0.612	0.543
Timor Lorosae (East Timor)	737	0.555	0.469	0.472	0.499				
Togo	4,527	0.586	0.436	0.519	0.514	0.720	0.549	0.634	0.574
Tokelau	1	0.580		0.479	0.530	0.358	0.246	0.302	0.416
Tonga	99	0.518	0.352	0.447	0.439	0.444	0.464	0.454	0.447
Trinidad & Tobago	1,294	0.403	0.374	0.399	0.392	0.711	0.580	0.646	0.519
Tunisia	9,459	0.330	0.173	0.374	0.292	0.493	0.429	0.461	0.377
Turkey	66,668	0.448	0.239	0.407	0.365	0.456	0.550	0.503	0.434
Turkmenistan	4,737	0.552	0.242	0.468	0.421	0.592		0.592	0.506
Turks & Caicos Islands	17	0.432	0.395	0.425	0.417	0.666	0.586	0.626	0.522
Tuvalu	10	0.460	0.416	0.499	0.458	0.391		0.391	0.425
Uganda	23,300	0.509	0.431	0.470	0.470	0.742	0.518	0.630	0.550
Ukraine	49,568	0.444	0.231	0.442	0.372	0.453	0.470	0.462	0.417
United Arab Emirates	2,606	0.587	0.283	0.499	0.456	0.382		0.382	0.419
United Kingdom	59,634	0.489	0.335	0.488	0.437	0.383	0.237	0.310	0.373
United States of America	283,230	0.628	0.499	0.590	0.572	0.544	0.600	0.572	0.572
Uruguay	3,337	0.398	0.288	0.458	0.382	0.617	0.513	0.565	0.473
US Virgin Islands	121	0.460	0.344	0.422	0.409	0.628		0.628	0.519
Uzbekistan	24,881	0.480	0.223	0.469	0.391	0.460	0.509	0.484	0.438
Vanuatu	197	0.882	0.668	0.788	0.779	0.558	0.535	0.546	0.663
Vatican State	1	0.638		0.522	0.580				
Venezuela	24,170	0.507	0.397	0.484	0.463	0.811	0.795	0.803	0.633
Viet Nam	78,137	0.543	0.460	0.483	0.495	0.563	0.576	0.569	0.532
Wake Island	-	0.482			0.482				
Wallis & Futuna Islands	14	0.500	0.429	0.401	0.443	0.503	0.612	0.557	0.500
Yemen	18,349	0.333	0.259	0.325	0.306	0.408	0.326	0.367	0.336
Yugoslavia	10,552	0.372	0.243	0.419	0.345	0.535	0.541	0.538	0.441
Zambia	10,421	0.542	0.509	0.553	0.535	0.732	0.570	0.651	0.593
Zimbabwe	12,627	0.427	0.369	0.438	0.411	0.709	0.544	0.626	0.519
theoretical minimum value	10,000	-	-	-	-	-	-	-	-

Table 4. Highest 15 countries in IBCD-RICH and its component indicators.

Index of Biocultural Diversity IBCD-RICH	Language diversity index, LD-RICH	Religion diversity index, RD-RICH	Ethnic Group diversity index, ED-RICH	Birds and mammals diversity index, MD-RICH	Plants diversity index, PD-RICH
Indonesia	PNG	PNG	PNG	Colombia	Brazil
PNG	Indonesia	Indonesia	Indonesia	Indonesia	Colombia
Brazil	Nigeria	Nigeria	Nigeria	Peru	China
India	India	India	India	Brazil	Indonesia
China	Australia	Cameroon	USA	Ecuador	Mexico
Nigeria	Mexico	Japan	Cameroon	Venezuela	South Africa
USA	Cameroon	Brazil	Mexico	China	Venezuela
Cameroon	USA	Congo, DR	Congo, DR	Congo, DR	USA
Congo, DR	Brazil	Korea, Rep	China	India	Ecuador
Colombia	Congo, DR	China	Sudan	Mexico	India
Mexico	China	Philippines	Brazil	Argentina	Bolivia
Australia	Philippines	USA	Philippines	Kenya	Peru
Peru	Canada	Malaysia	Malaysia	Uganda	Australia
Malaysia	Malaysia	Sudan	Russia	Myanmar	Malaysia
Tanzania	Sudan	Tanzania	Kenya	Tanzania	Costa Rica

Table 5. Highest 15 countries in IBCD-AREA and its component indicators.

Index of Biocultural Diversity IBCD-AREA	Language diversity index, LD-AREA	Religion diversity index, RD-AREA	Ethnic Group diversity index, ED-AREA	Bird & mammal diversity index, MD-AREA	Plant diversity index, PD-AREA
Indonesia	PNG	PNG	PNG	Brunei	Colombia
PNG	Indonesia	Indonesia	Indonesia	Ecuador	Costa Rica
Colombia	Nigeria	Nigeria	Nigeria	Panama	Brunei
Cameroon	Vanuatu	Cameroon	Vanuatu	Rwanda	Ecuador
Malaysia	Cameroon	Korea, Rep	Cameroon	Costa Rica	Brazil
Brunei	India	Japan	India	Trinidad & Tob	Indonesia
India	Philippines	India	Philippines	Colombia	Panama
Nigeria	Mexico	Philippines	Mexico	Uganda	Malaysia
Nepal	Solomon Is.	Vanuatu	Malaysia	Peru	South Africa
Brazil	Nepal	Malaysia	Congo, DR	Burundi	Venezuela
Mexico	Malaysia	Solomon Is.	Nepal	Gambia	Mexico
Peru	Israel	Congo, DR	Sudan	Venezuela	Guatemala
Ecuador	Congo, DR	Tanzania	Solomon Is.	Bhutan	Bolivia
Viet Nam	Australia	Brazil	Kenya	Belize	Haiti
Philippines	New Caledonia	Nepal	USA	Indonesia	Peru

Table 6. Highest 15 countries in IBCD-POP and its component indicators.

Index of Biocultural Diversity IBCD-POP	Language diversity index, LD-POP	Religion diversity index, RD-POP	Ethnic Group diversity index, ED-POP	Bird & mammal diversity index, MD-POP	Plant diversity index, PD-POP
PNG	PNG	PNG	PNG	Suriname	Colombia
French Guiana	Vanuatu	Nigeria	Vanuatu	Guyana	French Guiana
Cameroon	Cameroon	Indonesia	Indonesia	French Guiana	Brunei
Indonesia	Australia	Cameroon	Cameroon	Belize	Brazil
Suriname	Indonesia	Vanuatu	Nigeria	Brunei	Bolivia
Solomon Islands	Solomon Islands	Solomon Islands	Solomon Islands	Ecuador	Ecuador
Colombia	Nigeria	Korea, Rep	Sudan	Panama	Costa Rica
Brunei	New Caledonia	Congo, Dem Rep	New Caledonia	Liechtenstein	Guyana
Gabon	Chad	Japan	Congo, Dem Rep	Peru	Suriname
Guyana	Mexico	Bougainville	Chad	Gabon	Panama
Australia	Congo, DR	Malaysia	Mexico	Equatorial Guinea	PNG
Brazil	CAR	Laos	Malaysia	Namibia	Venezuela
Peru	Laos	Philippines	CAR	Colombia	Gabon
Laos	Malaysia	Sudan	Laos	Venezuela	New Caledonia
Congo	Nauru	Brazil	Bougainville	PNG	South Africa

Table 7. Correlations between the five indicators and area and population (correlations $R^2 > 0.6$ in boldface).

Correlation (R2)	**Area**	**Population**
Languages	0.58	0.57
Religions	0.38	0.42
Ethnic groups	**0.61**	**0.65**
Birds and mammals	**0.71**	**0.63**
Plants	0.59	**0.65**
CD vs BD	0.20	0.20

Table 8. Correlations between cultural diversity and biodiversity (correlations $R^2 > 0.6$ in boldface).

Correlation (R2)	**CD-RICH**	**CD-AREA**	**CD-POP**
BD-RICH	**0.63**	0.07	0.06
BD-AREA	0.08	0.20	0.05
BD-POP	0.08	0.04	0.20

Table 9. Summary of rankings: IBCD-RICH, IBCD-AREA, and IBCD-POP.

Country or Territory	(1) Index of Biocultural Diversity, IBCD-RICH	(2) Rank, IBCD-RICH	(3) Index of Biocultural Diversity, IBCD-AREA	(4) Rank, IBCD-AREA	(5) Index of Biocultural Diversity, IBCD-POP	(6) Rank, IBCD-POP	(7) Spread Between Highest and Lowest Rank	(8) Average, IBCD-RICH, IBCD-AREA, IBCD-POP	(9) Rank, Average IBCD
Papua New Guinea	0.728	2	0.802	2	0.865	1	1	0.798	1
Indonesia	0.760	1	0.813	1	0.718	4	3	0.764	2
Cameroon	0.671	8	0.725	4	0.720	3	5	0.705	3
Colombia	0.664	10	0.729	3	0.697	7	7	0.697	4
Brazil	0.710	3	0.681	10	0.677	12	9	0.689	5
Malaysia	0.640	14	0.712	5	0.664	16	11	0.672	6
Nigeria	0.688	6	0.693	8	0.607	31	25	0.663	7
Peru	0.642	13	0.666	12	0.674	13	1	0.660	8
Congo, Dem Rep (Zaire)	0.669	9	0.649	19	0.654	20	11	0.657	9
Mexico	0.663	11	0.667	11	0.623	27	16	0.651	10
India	0.709	4	0.697	7	0.541	59	55	0.649	11
Tanzania	0.638	15	0.651	16	0.631	25	10	0.640	12
Laos	0.594	27	0.649	18	0.671	14	13	0.638	13
Brunei	0.497	80	0.708	6	0.695	8	74	0.633	14
Nepal	0.606	23	0.690	9	0.598	35	26	0.631	15
Australia	0.646	12	0.552	61	0.681	11	50	0.627	16
Solomon Islands	0.538	48	0.638	22	0.703	6	42	0.626	17
Venezuela	0.607	22	0.639	21	0.633	24	3	0.626	18
Ecuador	0.576	31	0.662	13	0.628	26	18	0.622	19
United States of America	0.678	7	0.593	37	0.572	45	38	0.614	20
Congo	0.574	34	0.595	35	0.671	15	20	0.613	21
Myanmar	0.619	17	0.635	23	0.579	40	23	0.611	22
China	0.689	5	0.628	27	0.514	79	74	0.610	23
Panama	0.537	49	0.650	17	0.642	23	32	0.610	24
Kenya	0.608	21	0.628	26	0.590	38	17	0.609	25
Bolivia	0.581	30	0.585	39	0.656	19	20	0.608	26
Gabon	0.549	43	0.579	41	0.693	9	34	0.607	27
Philippines	0.617	19	0.652	15	0.535	63	48	0.601	28
Suriname	0.518	61	0.562	48	0.712	5	56	0.597	29
Viet Nam	0.605	24	0.654	14	0.532	66	52	0.597	30
Central African Republic	0.575	32	0.555	56	0.651	21	35	0.594	31
French Guiana	0.488	83	0.555	58	0.730	2	81	0.591	32
Ghana	0.585	28	0.621	28	0.567	50	22	0.591	33
Thailand	0.599	25	0.630	25	0.543	56	31	0.591	34
Cote d'Ivoire (Ivory Coast)	0.584	29	0.603	34	0.577	41	12	0.588	35
South Africa	0.594	26	0.593	36	0.573	44	18	0.587	36
Guyana	0.518	63	0.555	55	0.683	10	53	0.585	37
Ethiopia	0.613	20	0.593	38	0.550	54	34	0.585	38
Guatemala	0.549	42	0.635	24	0.568	49	25	0.584	39
Vanuatu	0.502	75	0.582	40	0.663	17	58	0.582	40
Costa Rica	0.513	69	0.641	20	0.591	37	49	0.581	41
Uganda	0.571	36	0.619	29	0.550	53	24	0.580	42
Sudan	0.618	18	0.538	69	0.583	39	51	0.580	43

Togo	0.532	54	0.617	30	0.574	43	24	0.574	44
Bhutan	0.508	73	0.611	32	0.601	34	41	0.573	45
Zambia	0.571	35	0.550	63	0.593	36	28	0.571	46
Paraguay	0.545	46	0.561	49	0.606	33	16	0.571	47
Belize	0.466	104	0.574	43	0.660	18	86	0.567	48
New Caledonia	0.469	101	0.555	57	0.646	22	79	0.557	49
Benin	0.535	50	0.576	42	0.552	51	9	0.554	50
Angola	0.565	39	0.522	83	0.576	42	44	0.554	51
Equatorial Guinea	0.468	103	0.567	47	0.622	28	75	0.552	52
Liberia	0.515	66	0.557	53	0.571	47	19	0.548	53
Argentina	0.575	33	0.510	92	0.543	57	59	0.542	54
Russia	0.622	16	0.471	121	0.523	70	105	0.539	55
Nicaragua	0.502	74	0.561	50	0.551	52	24	0.538	56
Botswana	0.524	58	0.471	119	0.619	29	90	0.538	57
Chad	0.566	38	0.473	117	0.570	48	79	0.536	58
Israel	0.501	77	0.607	33	0.499	92	59	0.536	59
Mozambique	0.548	44	0.514	90	0.529	67	46	0.530	60
Honduras	0.502	76	0.558	52	0.528	68	24	0.529	61
Sierra Leone	0.499	79	0.554	59	0.525	69	20	0.526	62
Trinidad & Tobago	0.445	129	0.614	31	0.519	76	98	0.526	63
Namibia	0.512	70	0.452	131	0.607	32	99	0.524	64
Malawi	0.511	71	0.560	51	0.499	91	40	0.523	65
Zimbabwe	0.526	55	0.523	82	0.519	75	27	0.523	66
Senegal	0.524	57	0.530	75	0.512	80	23	0.522	67
Guinea	0.517	64	0.518	86	0.519	74	22	0.518	68
Gambia	0.458	119	0.573	44	0.519	73	75	0.517	69
Burkina Faso	0.532	53	0.503	96	0.494	94	43	0.510	70
Madagascar	0.523	59	0.498	102	0.505	85	43	0.509	71
Cambodia	0.495	81	0.540	68	0.489	99	31	0.508	72
Guinea-Bissau	0.466	106	0.515	89	0.533	64	42	0.505	73
Eritrea	0.462	114	0.521	84	0.521	72	42	0.501	74
Pakistan	0.561	40	0.524	81	0.419	159	119	0.501	75
Iran	0.555	41	0.484	112	0.459	122	81	0.499	76
Georgia	0.473	98	0.531	73	0.493	96	25	0.499	77
Japan	0.545	45	0.543	66	0.404	175	130	0.497	78
Switzerland	0.478	92	0.544	65	0.463	118	53	0.495	79
Azerbaijan	0.483	87	0.525	80	0.474	107	27	0.494	80
Bangladesh	0.532	52	0.570	46	0.378	187	141	0.493	81
Taiwan	0.493	82	0.571	45	0.416	162	117	0.493	82
Tajikistan	0.482	89	0.500	98	0.495	93	9	0.492	83
Liechtenstein	0.369	170	EXCLUDED	#VALUE!	0.615	30	#VALUE!	0.492	84
France	0.539	47	0.502	97	0.432	149	102	0.491	85
Swaziland	0.423	152	0.529	76	0.517	78	76	0.490	86
Greece	0.488	84	0.513	91	0.467	112	28	0.489	87
Austria	0.483	88	0.516	88	0.465	115	27	0.488	88
Kyrghyzstan	0.481	90	0.479	114	0.504	87	27	0.488	89
Armenia	0.452	126	0.538	70	0.474	108	56	0.488	90
Macedonia	0.442	133	0.528	77	0.494	95	56	0.488	91
Turkey	0.534	51	0.495	104	0.434	148	97	0.488	92
Canada	0.566	37	0.385	162	0.508	82	125	0.486	93
El Salvador	0.453	125	0.557	54	0.442	135	81	0.484	94
Slovenia	0.436	140	0.530	74	0.485	100	66	0.484	95

Dominica	0.360	173	0.550	64	0.537	61	112	0.482	96
Kazakhstan	0.524	56	0.414	145	0.502	88	89	0.480	97
Luxembourg	0.393	160	0.551	62	0.491	98	98	0.478	98
Singapore	0.474	97	EXCLUDED	#VALUE!	0.482	102	#VALUE!	0.478	99
Afghanistan	0.516	65	0.458	127	0.458	124	62	0.477	100
Andorra	0.382	163	EXCLUDED	#VALUE!	0.572	46	#VALUE!	0.477	101
Italy	0.515	67	0.505	95	0.405	173	106	0.475	102
Lebanon	0.432	146	0.553	60	0.440	138	86	0.475	103
Micronesia	0.397	157	EXCLUDED	#VALUE!	0.547	55	#VALUE!	0.472	104
Rwanda	0.446	128	0.543	67	0.425	155	88	0.471	105
Yugoslavia	0.472	99	0.500	99	0.441	136	37	0.471	106
Ukraine	0.518	62	0.472	118	0.417	161	99	0.469	107
Jamaica	0.426	150	0.534	71	0.445	131	79	0.468	108
Uzbekistan	0.500	78	0.466	125	0.438	143	65	0.468	109
Croatia	0.447	127	0.499	100	0.457	125	27	0.468	110
Estonia	0.437	137	0.471	120	0.493	97	40	0.467	111
Turkmenistan	0.459	118	0.435	140	0.506	83	57	0.467	112
Bulgaria	0.466	105	0.484	111	0.448	128	23	0.466	113
Portugal	0.464	110	0.497	103	0.436	145	42	0.466	114
Mali	0.510	72	0.405	152	0.476	105	80	0.464	115
Mongolia	0.480	91	0.369	165	0.538	60	105	0.463	116
Belgium	0.463	112	0.521	85	0.404	174	89	0.463	117
Burundi	0.437	139	0.527	79	0.424	157	78	0.462	118
Netherlands	0.476	94	0.517	87	0.392	179	92	0.462	119
Germany	0.522	60	0.485	110	0.376	190	130	0.461	120
Netherlands Antilles	0.384	162	EXCLUDED	#VALUE!	0.533	65	#VALUE!	0.458	121
Slovakia	0.444	131	0.494	105	0.436	144	39	0.458	122
Fiji	0.423	153	0.468	124	0.483	101	52	0.458	123
United Kingdom	0.515	68	0.482	113	0.373	193	125	0.457	124
Albania	0.425	151	0.498	101	0.444	134	50	0.456	125
Somalia	0.475	96	0.427	142	0.460	119	46	0.454	126
Saint Vincent / Grenadines	0.373	167	EXCLUDED	#VALUE!	0.535	62	#VALUE!	0.454	127
Sri Lanka	0.462	115	0.508	93	0.390	181	88	0.453	128
Uruguay	0.454	124	0.433	141	0.473	109	32	0.453	129
Puerto Rico	0.422	154	0.528	78	0.407	168	90	0.452	130
New Zealand	0.468	102	0.410	148	0.473	110	46	0.450	131
Chile	0.484	86	0.420	144	0.445	132	58	0.450	132
Moldova	0.437	138	0.486	109	0.426	154	45	0.450	133
Martinique	0.365	171	0.534	72	0.444	133	99	0.448	134
Bosnia-Herzegovina	0.414	155	0.487	108	0.440	137	47	0.447	135
Dominican Republic	0.441	135	0.490	106	0.409	166	60	0.447	136
Norway	0.465	107	0.405	151	0.463	117	44	0.445	137
Latvia	0.435	142	0.444	134	0.452	126	16	0.444	138
Denmark	0.441	134	0.473	116	0.414	164	48	0.443	139
French Polynesia	0.375	166	0.470	122	0.480	104	62	0.442	140
Hungary	0.455	121	0.464	126	0.407	169	48	0.442	141
Sao Tome e Principe	0.345	178	0.508	94	0.472	111	84	0.442	142
Lithuania	0.436	141	0.452	130	0.435	147	17	0.441	143
Sweden	0.477	93	0.404	153	0.440	139	60	0.440	144
Romania	0.470	100	0.448	132	0.391	180	80	0.436	145
Spain	0.485	85	0.438	139	0.386	186	101	0.436	146
US Virgin Islands	0.350	175	EXCLUDED	#VALUE!	0.519	77	#VALUE!	0.434	147

Syria	0.462	116	0.442	137	0.392	178	62	0.432	148
Grenada	0.350	174	EXCLUDED	#VALUE!	0.506	84	#VALUE!	0.428	149
Palau	0.298	205	0.440	138	0.541	58	147	0.426	150
Antigua & Barbuda	0.337	182	EXCLUDED	#VALUE!	0.508	81	#VALUE!	0.423	151
Finland	0.454	123	0.378	163	0.431	151	40	0.421	152
Cuba	0.433	144	0.442	136	0.387	185	49	0.421	153
Cyprus	0.376	165	0.453	129	0.430	152	36	0.420	154
Iraq	0.457	120	0.413	146	0.388	184	64	0.419	155
Czech Republic	0.435	143	0.443	135	0.375	191	56	0.418	156
Jordan	0.427	149	0.420	143	0.405	172	29	0.417	157
Guadaloupe	0.346	177	0.488	107	0.415	163	70	0.417	158
Cayman Islands	0.323	191	EXCLUDED	#VALUE!	0.504	86	#VALUE!	0.413	159
Morocco	0.465	108	0.407	149	0.368	197	89	0.413	160
Turks & Caicos Islands	0.304	204	EXCLUDED	#VALUE!	0.522	71	#VALUE!	0.413	161
Belarus	0.443	132	0.406	150	0.389	182	50	0.413	162
Bahamas	0.363	172	0.403	154	0.459	120	52	0.408	163
Korea, Rep	0.455	122	0.457	128	0.313	209	87	0.408	164
United Arab Emirates	0.409	156	0.393	159	0.419	158	3	0.407	165
Mauritius	0.371	169	0.478	115	0.363	198	83	0.404	166
Aruba	0.340	181	EXCLUDED	#VALUE!	0.466	114	#VALUE!	0.403	167
Tunisia	0.431	147	0.400	156	0.377	188	41	0.403	168
Gibraltar	0.305	202	EXCLUDED	#VALUE!	0.500	90	#VALUE!	0.403	169
Oman	0.432	145	0.340	169	0.435	146	24	0.402	170
Poland	0.460	117	0.410	147	0.337	204	87	0.402	171
Djibouti	0.372	168	EXCLUDED	#VALUE!	0.432	150	#VALUE!	0.402	172
Niger	0.462	113	0.332	171	0.410	165	58	0.402	173
Comoros	0.348	176	0.470	123	0.373	194	71	0.397	174
Northern Mariana Islands	0.333	188	EXCLUDED	#VALUE!	0.459	121	#VALUE!	0.396	175
Saint Kitts & Nevis	0.306	201	EXCLUDED	#VALUE!	0.482	103	#VALUE!	0.394	176
Wallis & Futuna Islands	0.286	208	EXCLUDED	#VALUE!	0.500	89	#VALUE!	0.393	177
Algeria	0.476	95	0.326	172	0.377	189	94	0.393	178
Haiti	0.394	158	0.446	133	0.339	203	70	0.393	179
Saint Lucia	0.331	189	EXCLUDED	#VALUE!	0.451	127	#VALUE!	0.391	180
American Samoa	0.321	194	EXCLUDED	#VALUE!	0.459	123	#VALUE!	0.390	181
Tonga	0.329	190	EXCLUDED	#VALUE!	0.447	129	#VALUE!	0.388	182
Mauritania	0.428	148	0.287	176	0.438	142	34	0.385	183
Cook Islands	0.291	207	EXCLUDED	#VALUE!	0.475	106	#VALUE!	0.383	184
Lesotho	0.379	164	0.390	161	0.375	192	31	0.382	185
Faeroe Islands	0.296	206	0.399	157	0.446	130	76	0.380	186
Seychelles	0.322	192	EXCLUDED	#VALUE!	0.439	141	#VALUE!	0.380	187
Libya	0.444	130	0.275	177	0.418	160	47	0.379	188
Saudi Arabia	0.464	111	0.297	174	0.371	195	84	0.377	189
Ireland	0.393	159	0.366	166	0.356	199	40	0.372	190
Malta	0.342	180	EXCLUDED	#VALUE!	0.401	176	#VALUE!	0.372	191
Mayotte	0.316	196	EXCLUDED	#VALUE!	0.427	153	#VALUE!	0.371	192
Yemen	0.438	136	0.340	170	0.336	205	69	0.371	193
Egypt	0.464	109	0.344	168	0.302	212	103	0.370	194
Samoa, Western	0.310	199	0.390	160	0.406	170	39	0.369	195
Guam	0.319	195	0.397	158	0.389	183	37	0.368	196
San Marino	0.248	213	EXCLUDED	#VALUE!	0.465	116	#VALUE!	0.356	197
Reunion	0.335	186	0.402	155	0.331	206	51	0.356	198
Cape Verde	0.312	198	0.375	164	0.351	200	36	0.346	199

Barbados	0.313	197	EXCLUDED	#VALUE!	0.370	196	#VALUE!	0.341	200
Anguilla	0.242	214	EXCLUDED	#VALUE!	0.439	140	#VALUE!	0.341	201
Qatar	0.336	184	0.324	173	0.346	202	29	0.335	202
Nauru	0.259	210	EXCLUDED	#VALUE!	0.409	167	#VALUE!	0.334	203
Bahrain	0.335	185	EXCLUDED	#VALUE!	0.328	207	#VALUE!	0.332	204
Korea, DPR	0.385	161	0.350	167	0.260	214	53	0.331	205
Maldives	0.305	203	EXCLUDED	#VALUE!	0.350	201	#VALUE!	0.328	206
Iceland	0.334	187	0.234	179	0.405	171	16	0.325	207
Montserrat	0.321	193	EXCLUDED	#VALUE!	EXCLUDED	#VALUE!	#VALUE!	0.321	208
Tuvalu	0.218	218	EXCLUDED	#VALUE!	0.425	156	#VALUE!	0.321	209
Sahara, Western	0.344	179	0.159	180	0.400	177	3	0.301	210
Kuwait	0.336	183	0.295	175	0.268	213	38	0.300	211
Kiribati	0.258	212	EXCLUDED	#VALUE!	0.316	208	#VALUE!	0.287	212
Saint Helena	0.274	209	EXCLUDED	#VALUE!	EXCLUDED	#VALUE!	#VALUE!	0.274	213
Bermuda	0.235	215	EXCLUDED	#VALUE!	0.309	210	#VALUE!	0.272	214
Greenland	0.308	200	0.034	181	0.466	113	87	0.269	215
Marshall Islands	0.228	217	EXCLUDED	#VALUE!	0.306	211	#VALUE!	0.267	216
Falkland Is (Islas Malvinas)	0.258	211	0.246	178	EXCLUDED	#VALUE!	#VALUE!	0.252	217
Niue	0.233	216	EXCLUDED	#VALUE!	EXCLUDED	#VALUE!	#VALUE!	0.233	218
British Indian Ocean Terr	0.218	219	EXCLUDED	#VALUE!	EXCLUDED	#VALUE!	#VALUE!	0.218	219
Pitcairn	0.213	220	EXCLUDED	#VALUE!	EXCLUDED	#VALUE!	#VALUE!	0.213	220
Tokelau	0.156	221	EXCLUDED	#VALUE!	EXCLUDED	#VALUE!	#VALUE!	0.156	221
Bougainville		#N/A		#N/A		#N/A	#N/A		#N/A
British Virgin Islands		#N/A		#N/A		#N/A	#N/A		#N/A
Channel Islands		#N/A		#N/A		#N/A	#N/A		#N/A
Christmas Island		#N/A		#N/A		#N/A	#N/A		#N/A
Cocos (Keeling) Islands		#N/A		#N/A		#N/A	#N/A		#N/A
Isle of Man		#N/A		#N/A		#N/A	#N/A		#N/A
Midway Islands		#N/A		#N/A		#N/A	#N/A		#N/A
Monaco		#N/A		#N/A		#N/A	#N/A		#N/A
Norfolk Island		#N/A		#N/A		#N/A	#N/A		#N/A
Northern Cyprus		#N/A		#N/A		#N/A	#N/A		#N/A
Palestine		#N/A		#N/A		#N/A	#N/A		#N/A
Saint Pierre & Miquelon		#N/A		#N/A		#N/A	#N/A		#N/A
Somaliland		#N/A		#N/A		#N/A	#N/A		#N/A
Spanish North Africa		#N/A		#N/A		#N/A	#N/A		#N/A
Svalbard/Jan Mayen		#N/A		#N/A		#N/A	#N/A		#N/A
Timor Lorosae (East Timor)		#N/A		#N/A		#N/A	#N/A		#N/A
Vatican State		#N/A		#N/A		#N/A	#N/A		#N/A
Wake Island		#N/A		#N/A		#N/A	#N/A		#N/A
WORLD/theoretical max value	1.000		1.000		1.000				

Table 10. Status of native languages in Canada, 1996. Source: Modified from Norris 1998, 13. Data for the Iroquoian family are not particularly representative due to incomplete enumeration of reserves. Other languages may also be affected by incomplete enumeration.

	Mother-Tongue Population	Index of Continuity	Index of Ability	Average Age of Mother-Tongue Speakers
Algonquian Family	**146,635**	**70**	**117**	**30.9**
Cree	87,555	72	117	30.2
Ojibway	25,885	55	122	36.2
Montagnais-Naskapi	9,070	94	104	25.2
Micmac	7,310	72	111	29.9
Oji-Cree	5,400	80	114	26.3
Attikamek	3,995	97	103	21.9
Blackfoot	4,145	61	135	39.7
Algonquin	2,275	58	119	30.7
Malectite	655	37	148	44.0
Other Algonquian	350	40	159	52.2
Inuktitut Family	**27,780**	**86**	**109**	**23.9**
Athapaskan Family	**20,090**	**68**	**117**	**32.5**
Dene	9,000	86	107	24.8
South Slave	2,620	55	124	37.8
Dogrib	2,085	72	118	29.8
Carrier	2,190	51	130	41.4
Chipewyan	1,455	44	128	40.2
Athapaskan	1,310	37	129	44.7
Chilcotin	705	65	130	37.0
Kutchin-Gwich'in (Loucheux)	430	24	114	53.1
North Slave (Hare)	290	60	116	39.1
(Dakota) Siouan Family	**4,295**	**67**	**111**	**31.9**
Salish Family	**3,200**	**25**	**132**	**48.7**
Salish	1,850	24	130	49.7
Shuswap	745	25	134	46.3
Thompson	595	31	135	48.6
Tsimshian Family	**2,460**	**31**	**132**	**48.0**
Gitksan	1,200	39	123	45.2
Nishga	795	23	146	47.5
Tsimshian	465	24	132	55.9
Wakashan Family	**1,650**	**27**	**118**	**51.3**
Wakashan	1,070	24	129	53.0
Nootka	590	31	99	48.1
Iroquoian Family	**590**	**13**	**160**	**46.5**
Mohawk	350	10	184	46.1
Iroquoian	235	13	128	47.0
Haida Family	240	6	144	50.4

Tlingit Family	**145**	**21**	**128**	**49.3**
Kutenai Family	**120**	**17**	**200**	**52.3**
Other native languages	**1,405**	**28**	**176**	**47.0**
TOTAL	**208,610**	**70**	**117**	**31.0**

Table 11. Endemism in language and species: comparison of the top 25 countries, 1992 and 2000-2002 data. Countries appearing on both lists are in bold. 1992 figures for Ethiopia include Eritrea. Higher vertebrates include mammals, birds, reptiles, and amphibians; reptiles not included for USA, China, and Papua New Guinea because the number of endemic reptile species is not reported in the source table. 2000-2002 species data include only bird and mammal species only, hence the lower numbers in comparison with the 1992 data. Source: 1992 figures from Harmon (1996: 97); using figures derived from Grimes 1992b (languages) and Groombridge (1992: 139-141) (species). 2000-2002 figures from Grimes 2000 (languages) and Groombridge and Jenkins 2002 (species).

1992 data		*2000-2002 data*	
Endemic Languages (number)	Endemic Higher Vertebrate Species (number)	Endemic Languages (number)	Endemic Bird and Mammal Species (number)
1. **Papua New Guinea** (847)	**Australia** (1,346)	**Papua New Guinea** (820)	**Indonesia (630)**
2. **Indonesia** (655)	**Mexico** (761)	**Indonesia** (691)	**Australia** (556)
3. Nigeria (376)	**Brazil** (725)	Nigeria (454)	**Brazil** (304)
4. **India** (309)	**Indonesia** (673)	**India** (289)	**Philippines** (288)
5. **Australia** (261)	Madagascar (537)	**Mexico** (275)	**Mexico** (232)
6. **Mexico** (230)	**Philippines** (437)	**Australia** (264)	Madagascar (198)
7. **Cameroon** (201)	**India** (373)	Cameroon (201)	**USA** (172)
8. **Brazil** (185)	**Peru** (332)	USA (187)	**Peru** (161)
9. **Zaire** (158)	**Colombia** (330)	**Brazil** (178)	**Papua New Guinea** (159)
10. **Philippines** (153)	Ecuador (294)	**Congo, Dem Rep (Zaire)** (160)	**China** (153)
11. **USA** (143)	**USA** (284)	**Philippines** (155)	**India** (102)
12. Vanuatu (105)	**China** (256)	**China** (121)	**Colombia** (101)
13. **Tanzania** (101)	**Papua New Guinea** (203)	Vanuatu (107)	New Zealand (76)
14. Sudan (97)	Venezuela (186)	**Tanzania** (102)	Argentina (68)
15. Malaysia (92)	Argentina (168)	Sudan (98)	**Solomon Islands** (64)
16. **Ethiopia** (90)	Cuba (152)	**Malaysia** (94)	Japan (63)
17. **China** (77)	South Africa (146)	Chad (88)	Ecuador (62)
18. **Peru** (75)	**Zaire** (134)	Nepal (87)	Venezuela; **Ethiopia** (59)
19. Chad (74)	Sri Lanka (126)	**Peru** (82)	
20. Russia (71)	New Zealand (120)	**Solomon Islands** (72)	**Malaysia** (54)
21. **Solomon Islands** (69)	**Tanzania** (113)	**Russia** (62)	**Congo, Dem Rep (Zaire)** (52)
22. Nepal (68)	Japan (112)	**Ethiopia** (59)	South Africa (43)
23. **Colombia** (55)	**Cameroon** (105)	Cote d'Ivoire (58)	**Tanzania** ; Sri Lanka (39)
24. Côte d'Ivoire (51)	**Solomon Islands** (101)	**Colombia** (54)	
25. Canada (47)	**Ethiopia** (88) Somalia (88)	Canada (53)	**Russia** (35)

Table A-1. Greenberg A and H indices for Mexico, 1930. Data from the census of that year. Rankings are from highest to lowest scores. Source: Greenberg 1956 [1971:75-76]).

State	*A Index*	*Rank*	*H Index*	*Rank*
Aguas Calientes	.0016	29	.9997	6
Baja California Nord	.3893	7	.9434	18
Baja California Sur	.0315	24	.9999	3
Calima	.0140	28	1.0000	1t
Campeche	.4997	5	.7042	27
Coahuila	.0324	23	.9998	4t
Chihuahua	.1955	15	.9112	19
Distrito Federal	.1295	18	.9994	7
Durango	.0404	22	.9862	13
Guanajuato	.0152	26	.9992	8
Guerrero	.3655	9	.7371	25
Hidalgo	.5060	4	.6665	29
Jalisco	.0141	27	1.0000	1t
Mexico, Estado de	.3763	8	.8635	21
Morelos	.2476	13	.9949	12
Nayarit	.0720	19	.9588	14t
Nuevo Leon	.0288	25	.9978	10
Oaxaca	.8363	1	.4767	30
Puebla	.5922	2	.7043	26
Queretaro	.1665	17	.9469	18
Quintana Roo	.5508	3	.7448	24
San Luis Potosi	.3357	11	.8610	22
Sinaloa	.0618	20	.9950	11
Sonora	.2226	14	.9577	16
Tabasco	.1871	16	.9588	14t
Tamaulipas	.0570	21	.9988	9
Tlaxcala	.3104	12	.8982	20
Vera Cruz	.3465	10	.8175	23
Yucatan	.4056	6	.6824	28
Zacatecas	.0002	30	.9998	4t
Mexico	**.3122**		**.8366**	

Table A-2. Greenberg A Index for selected countries, 1880–2000. Where necessary, dates of censuses are rounded up or down to nearest decennial. Sources: 1880–1970 data from Lieberson et al. 1975 [1981, ____]; 2000 data from Grimes 2000.

	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	2000	change
Albania						0.140			0.100		0.260	0.120
Austria				0.240		0.050			0.020		0.140	-0.100
Belgium				0.550	0.540	0.540			0.560		0.650	0.100
Bulgaria	0.410	0.400	0.360	0.330	0.290	0.240			0.190		0.220	-0.190
Canada					0.540	0.600	0.600	0.570	0.580	0.560	0.550	0.010
Costa Rica								0.050	0.060		0.040	-0.010
Cyprus						0.320			0.370		0.370	0.050
Denmark						0.040			0.060		0.050	0.010
Dominican Republic								0.040	0.040		0.050	0.010
Estonia					0.240	0.200					0.480	0.240
Finland	0.250	0.240	0.230	0.210	0.200	0.190	0.180	0.160	0.140		0.140	-0.110
France						0.270			0.260		0.240	-0.030
Germany				0.150		0.020			0.000		0.180	0.030
Greece			0.060		0.140		0.040				0.140	0.080
Hungary				0.210	0.190	0.150			0.040		0.140	-0.070
India				0.800	0.820	0.830		0.810	0.840		0.930	0.130
Italy						0.060			0.020		0.590	0.530
Latvia					0.470	0.440					0.600	0.130
Liechtenstein								0.030	0.060		0.130	0.100
Mexico						0.310					0.130	-0.180
Netherlands						0.040			0.100		0.200	0.160
Norway						0.040		0.010			0.080	0.040
Pakistan								0.620	0.640		0.830	0.210
Philippines							0.850		0.850		0.850	0.000
Poland						0.500			0.230		0.120	-0.380
Portugal						0.010			0.000		0.020	0.010
Romania						0.450		0.250	0.220		0.200	-0.250
South Africa							0.860		0.870		0.870	0.010
Spain						0.510			0.450		0.440	-0.070
Sweden						0.020			0.040		0.370	0.350
Switzerland	0.440	0.440	0.460	0.470	0.450	0.440	0.430	0.440	0.470	0.530	0.530	0.090
Turkey					0.250	0.250		0.190	0.180		0.250	0.000
United Kingdom						0.050			0.040		0.070	0.020
Yugoslavia						0.440		0.440	0.450		0.320	-0.120
AVERAGE						0.265			0.272		0.329	0.060

Table A-3. Comparison of Greenberg A Index values with number of endemic languages, all countries with 50 or more endemic languages, 2000.

Source: A Index data from Grimes 2000; endemic language data derived from Grimes 2000.

Country	*A Index*	*Number of living endemic languages*	*Number of extinct endemic languages*	*Single dominant language present?*
Papua New Guinea	0.990	811	9	no
Cameroon	0.970	197	4	no
Vanuatu	0.970	106	1	no
Solomon Islands	0.970	67	5	no
Tanzania	0.950	100	2	no
Chad	0.950	86	2	no
India	0.930	278	11	no
Dem Rep of Congo	0.920	159	1	no
Côte d'Ivoire	0.910	57	1	no
Nigeria	0.880	446	8	no
Philippines	0.850	152	3	no
Ethiopia	0.840	55	4	no
Indonesia	0.830	688	3	no
Malaysia	0.750	93	1	no
Nepal	0.690	86	1	no
Sudan	0.560	90	8	no
Canada	0.550	48	5	yes (English)
China	0.480	120	1	yes (Mandarin Chinese)
USA	0.350	135	52	yes (English)
Peru	0.350	68	14	yes (Spanish)
Russia	0.270	59	3	yes (Russian)
Australia	0.130	233	31	yes (English)
Mexico	0.130	268	7	yes (Spanish)
Brazil	0.030	145	42	yes (Portuguese)
Colombia	0.030	34	20	yes (Spanish)

Figure 1. IBCD-RICH rankings, all countries.

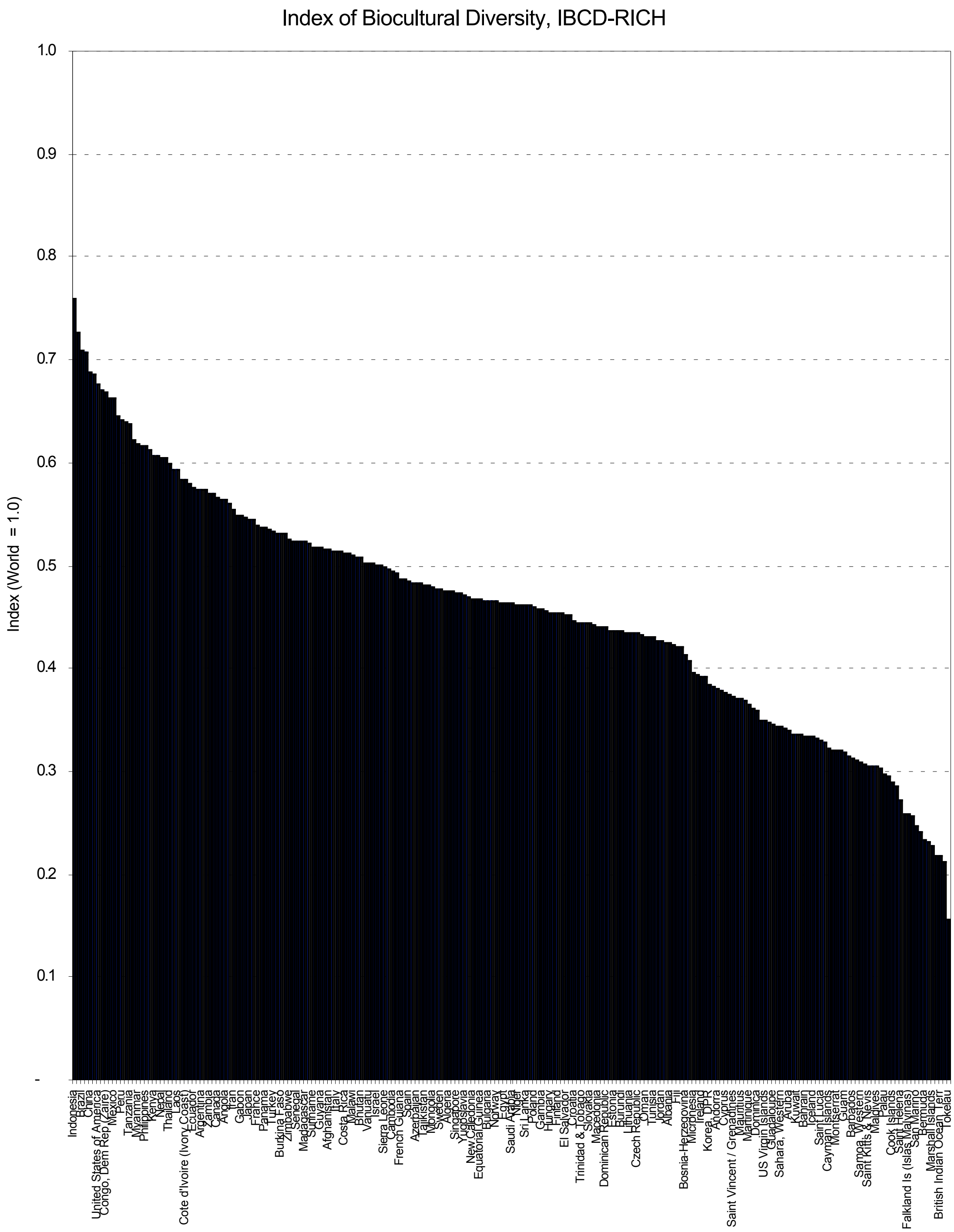

Figure 2. IBCD-RICH, highest-ranked countries.

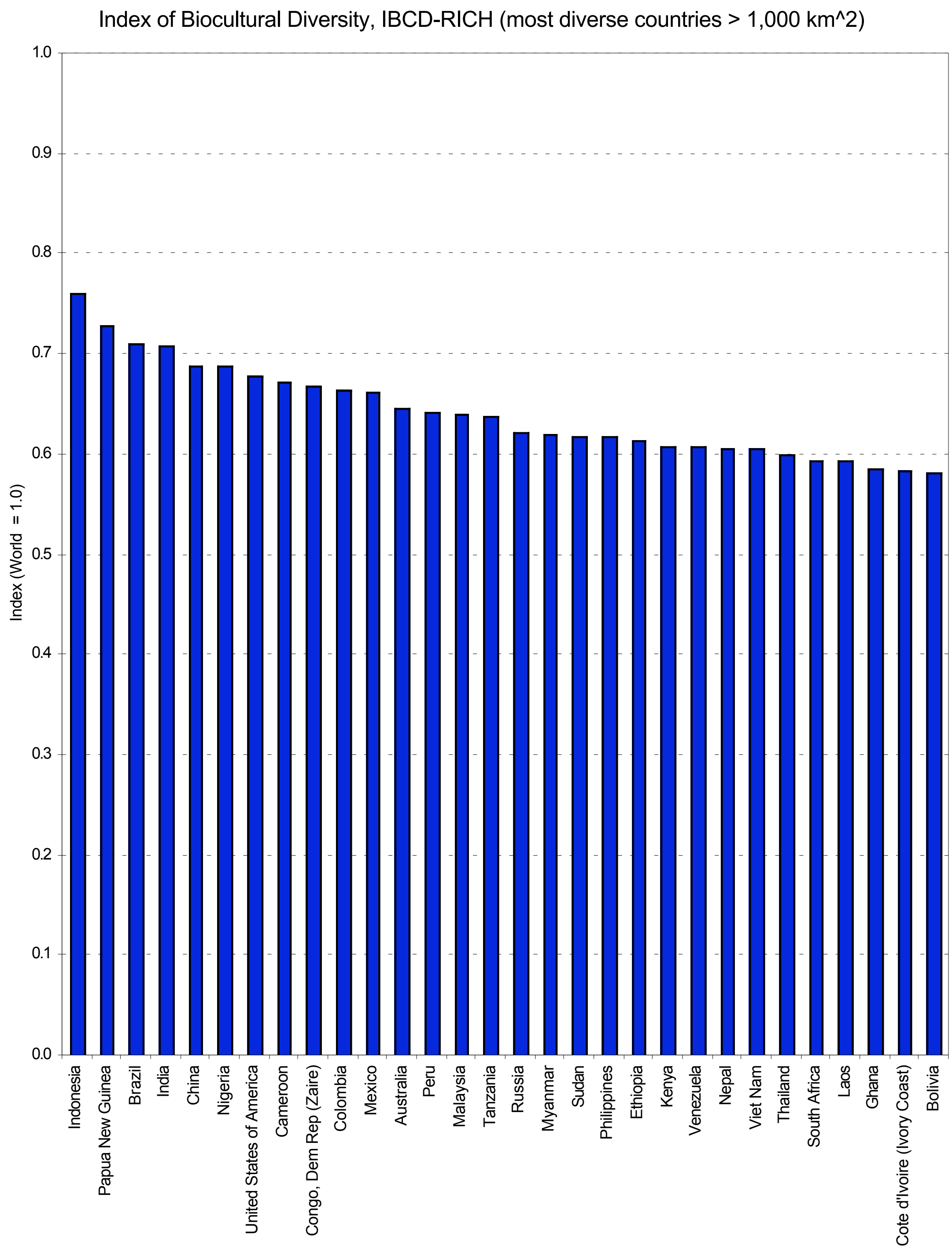

Figure 3. IBCD-AREA rankings, all countries.

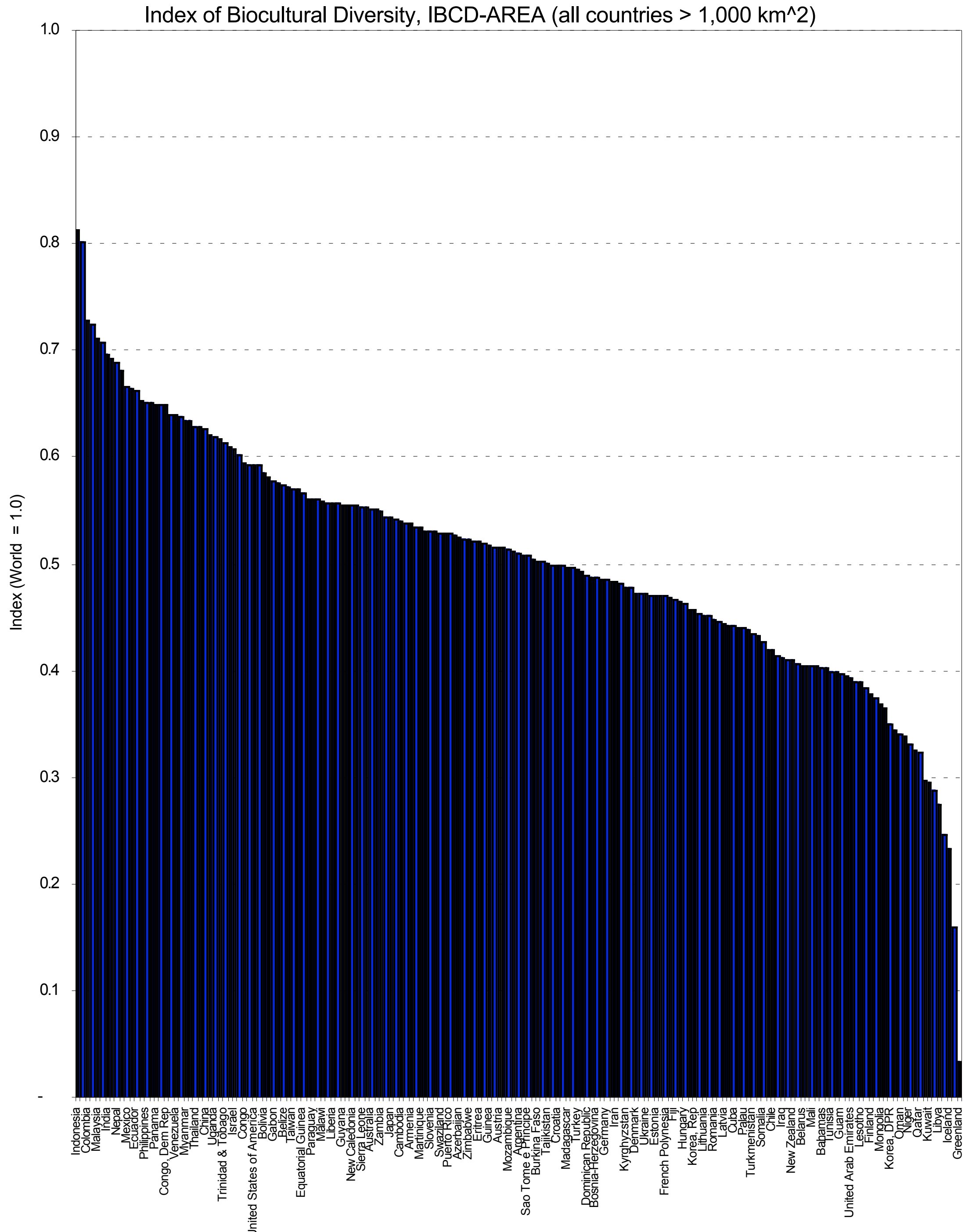

Figure 4. IBCD-AREA, highest-ranked countries.

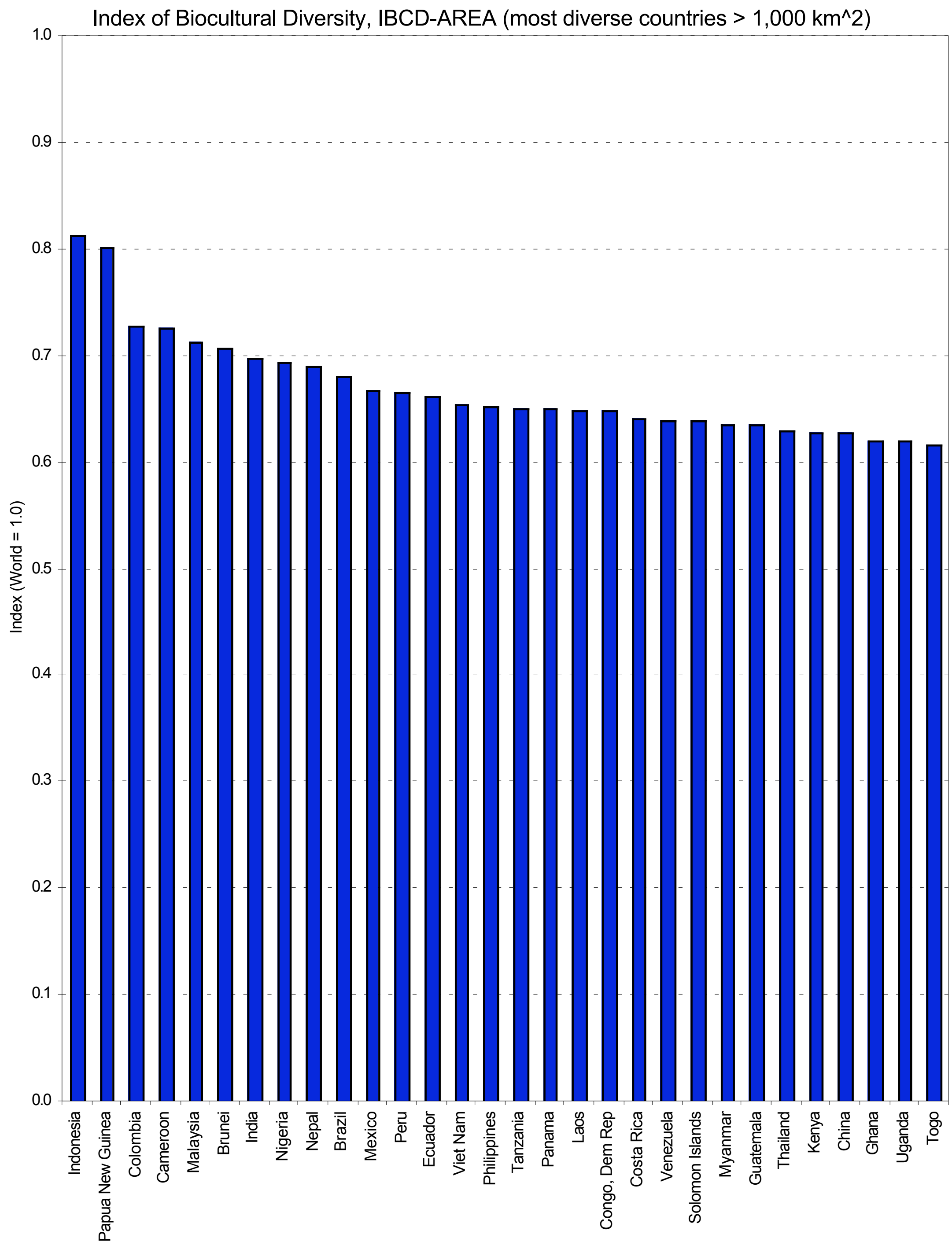

Figure 5. IBCD-POP rankings, all countries.

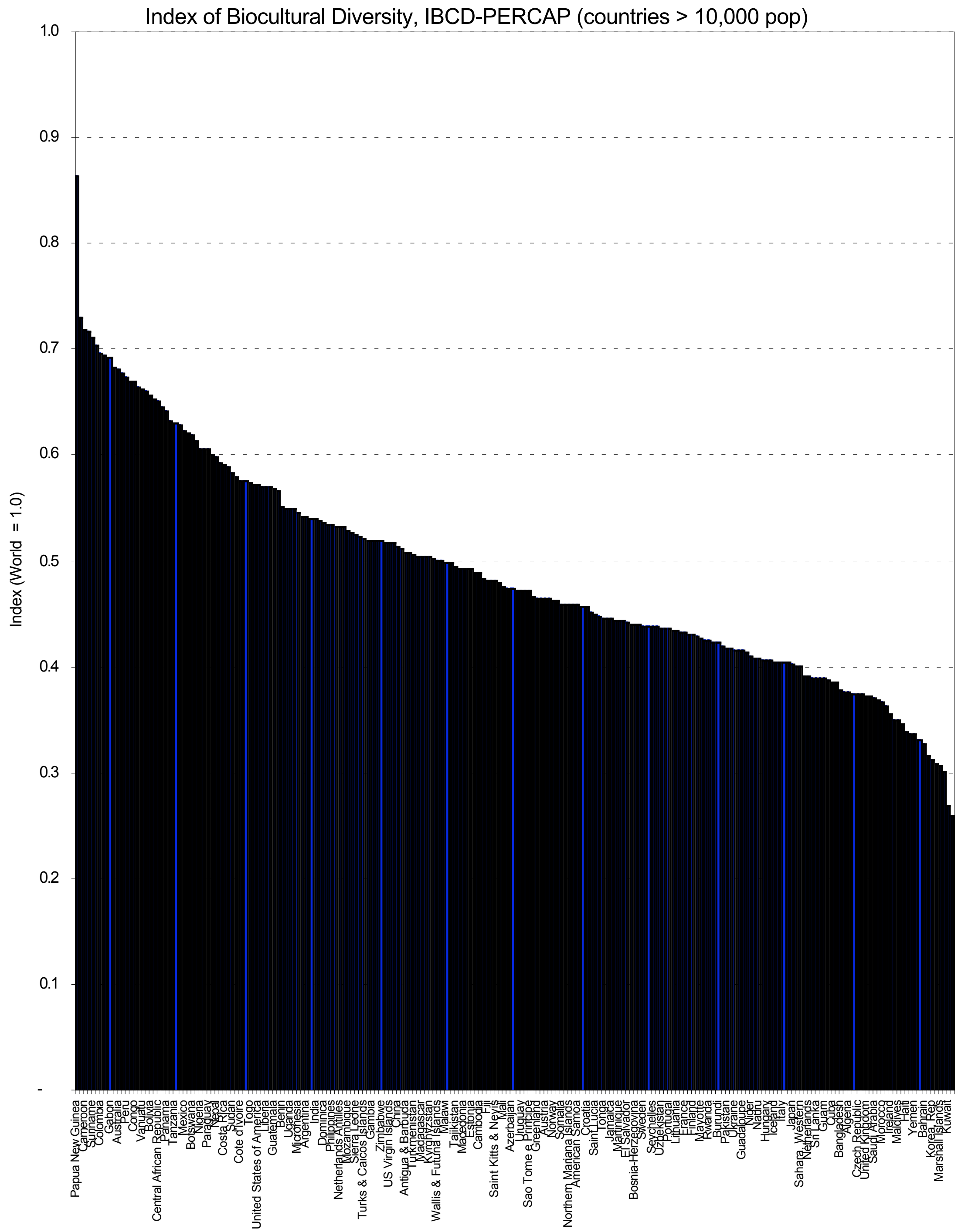

Figure 6. IBCD-POP, highest-ranked countries.