

a project of the Global Footprint Network Standards Committees





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Objective

The purpose of Standards for Ecological Footprint applications is to encourage the generation of mutually comparable and high-quality results. Such standards serve to make analyses robust, transparent, and reliable, and therefore lead to results that are trusted and relevant for decision makers at all levels.

There are two parts to the Ecological Footprint Standards:

- 1. <u>Applications Standards</u> define requirements for calculating Footprint results, to ensure that Footprint calculations are conducted in a consistent manner, so that results are reproducible and comparable with other studies employing common boundary definitions.
- 2. <u>Communication Standards</u> define requirements for reporting Footprint results, to ensure that project reports do not distort the intention nor misrepresent the limitations of the National Accounts.

Additional Information:

The Ecological Footprint Standards contain both compulsory Standards and voluntary Guidelines.

Standards are those elements that are required for Footprint studies to be certified. In other words, all standards (unless they are not applicable) must be met in order to qualify for certification. Global Footprint Network will establish a certification system based on these standards.

Guidelines are recommended practices which are not required for study certification.

Populations and Organizations – The Footprints of Consumers and Producers

Depending both on the subject and the research question that is being investigated, Ecological Footprint studies have significant differences.

For national and sub-national populations, Ecological Footprint studies often focus on consumption of the population as a whole. With studies that focus on a population's consumption, it is generally possible to draw boundaries that do not overlap, so that adding the Footprints of the various regional sub-populations of a nation sums to the Footprint of the nation.

This is in contrast to organizations such as manufacturing companies and service providers. These types of organizations are in the middle of a supply chain, where they consume goods and services in the production of other goods and services, which are either sold to a consumer, or sold to another organization along the supply chain. These organizations are both producers and (intermediate) consumers. Therefore special attention needs to be devoted to define the boundaries of investigation.

The fact that organizations are in the middle of the supply chain makes drawing study boundaries far more difficult for organizations, and it may not be possible to meet some requirements, such as <u>Standard 3.2</u>.

The Standards Committees decided to focus on Sub-National Population studies for this first release of the Standards. As a result, some of the requirements in this Standards release are not applicable in the case of organizations. This will be addressed in Ecological Footprint Standards 2007, which will be released in 2007.

Applicability of Ecological Footprint Standards 2006

These Standards can be used to assess the quality of any Footprint study, even if specific requirements are judged not applicable, or waived by the client.

In many such cases, it still may be possible to certify a study by defining the boundaries of the study, and then justifying why specific elements of the Ecological Footprint Standards 2006 are not applicable, with reference to the boundary constraints.

Even when it is not possible or desirable to certify a study, use of the Standards to assess the study is still valuable. Assessing the requirements, and indicating why they are not applicable or appropriate, helps users of the study understand its limitations.

More information supporting these standards, and the related certification process, is found at <u>www.footprintstandards.org</u>.

Reference Information

There is a large body of literature relevant to designing and conducting Footprint studies. The <u>bibliography</u> is provided for information. It is not the intent of these Standards to endorse any particular paper or method; inclusion in this <u>bibliography</u> should not be interpreted as endorsement of any particular method or paper.

Standards: Outline

APPLICATION STANDARDS

- 1. <u>Consistency with National Footprint Accounts</u>
- 2. Definition of Study Boundaries
- 3. <u>Sub-National Population Calculations</u>
- 4. (Place holder for organizational and product studies: Not released)
- 5. <u>Derivative Conversion Factors</u>
- 6. <u>Consistency of Components</u>
- 7. Use of Non-Standard Elements in Footprint studies
- 8. (Place Holder for calculation methods Not Released)
- 9. Error Estimates (GUIDELINE)

COMMUNICATION STANDARDS

- 10. Traceability to National Footprint Accounts
- 11. Glossary, Definitions and Versions
- 12. <u>Separation of Analytical Footprint Results from Normative or Values-based</u> <u>Interpretations</u>
- 13. Footprint Scenarios
- 14. Footprint Study Limitations
- 15. Explanation of Link between Sustainability and Footprint
- 16. Citation of sources and description of methodologies
- 17. Reference to Standards and Certifying Bodies
- 18. Communication style (GUIDELINE)

References

Supporting Documents

Standard 1: Consistency with National Footprint Accounts

Intent:

To ensure that the assessment is consistent with the Global Footprint Network's National Footprint Accounts (NFA) for the country in which the assessment is made.

Additional Information:

The National Footprint Accounts are data sets that track each nation's and humanity's Footprint (demand on bioproductivity) and the biocapacity that is available within each nation and on this planet to meet human demand. The National Footprint Accounts are the ecological "books" that provide an accounting of the historical balance between this supply and demand, on both global and national levels.

To make Footprint studies comparable, the Standards require that each assessment is consistent with the National Footprint Accounts by either a) using conversion factors identical to the ones used by the National Footprint Accounts or b) by breaking down national totals from the National Footprint Accounts using appropriate techniques (<u>Note 1A</u>).

Requirements:

- 1.1 Results are expressed in global hectares (or global acres), using the appropriate equivalence and yield factors.
- 1.2 If the analysis directly or indirectly uses primary conversion factors (<u>Note 1B</u> and <u>Glossary</u>) they are identical with those used in the National Footprint Accounts for the appropriate country and year.
- 1.3 Land types used in the study are consistent with the National Footprint Accounts, both for the Footprint and (if included) the Biocapacity. The application maps both demand and biocapacity to the National Footprint Accounts land types (<u>Note 1C</u>).
- 1.4 Built-up land is treated in the same way as the National Footprint Accounts, i.e., it is expressed in global hectares, not actual hectares.
- 1.5 Where applicable, the assessment calculates the use of various energy sources and carriers (such as oil, gas, hydro-power) and the sequestration of CO₂ in the same way as the National Footprint Accounts. (<u>Note 1D</u>)
- 1.6 If the assessment includes additional data components or information not provided in the National Footprint Accounts (e.g. the energy Footprint has been broken down into different uses by activity or sector), this is clearly documented.
- 1.7 To permit comparisons with Standard-compliant Footprint studies, any additional parts of the calculation which are not consistent with the core standards are unambiguously differentiated. Therefore, the Footprint results are calculated and presented in two ways: 1) As the Footprint would be if the standards were strictly followed; and 2) As the Footprint would be with the non-standard components added. (e.g., if a Footprint was added for pollutants, which are currently not included in the National Footprint Accounts).(Note 1E)

1.8 If the analysis does not use the same embodied energy values as the National Footprint Accounts, or introduces new energy values where none are defined in the Accounts, the analysis clearly identifies which ones are different. The report explains why the National Footprint Accounts embodied energy values are inadequate to support the analysis. For comparability purposes, any parts of the embodied energy calculations which are different from the National Footprint Accounts method are clearly differentiated and presented separately. (Note 1E)

Notes:

(1A) Background discussions on maintaining compatibility with the National Footprint Accounts can be found in the <u>technical references</u>.

(1B) Primary Conversion Factors are used to convert from a primary product (e.g., roundwood for Forest Land, wheat for Cropland, or salmon for Fisheries) to the area (in gha) required to produce the primary product. Primary Conversion Factors are most often reported in units of annual tonnes of primary product/gha, but roundwood is reported in annual m³/gha and some energy sources (e.g., hydropower) are reported in annual MJ/gha. Secondary Conversion Factors are used to calculate the area needed to produce a secondary or daughter product (e.g., paper from wood for Forest Land, bread from wheat for Cropland, or frozen salmon croquettes from salmon from Fishing Grounds.) Secondary conversion factors are also reported in units of annual tonnes/gha (or possibly other annual units per gha, such as annual \$ per gha). Different methods exist for calculating the primary resource inputs for secondary products (e.g., Life Cycle Analysis (LCA), production recipes, Input-Output (IO) analysis, etc.).

(1C) This means using either average bioproductive land (in global hectares) or the breakdown to National Footprint Accounts land types: Cropland, Forest, Grazing Land, Builtup Land, Fishing Ground, and CO_2 Area (or CO_2 Sequestration Area) (also in global hectares).

(1D) In 2005, a working group was established to determine how to assess the Footprint of nuclear power in the National Footprint Accounts. This group may propose a different method of treating nuclear power in the National Footprint Accounts. If the National Accounts review committee approves of this new approach, implementation is expected no earlier than the 2007 National Footprint Accounts Editions.

(1E) Refer also to Standard 6: Use of Non-Standard Elements in Footprint studies.

Standard 2: Definition of Study Boundaries

Intent:

To ensure that the study boundaries are clearly defined.

Additional Information:

In order to compare Footprint studies, the boundaries must be clearly defined, so that the range of activities included in the study is clearly understood. The selection of study boundaries depends strongly on the specific goals of the Footprint study.

Requirements:

(Each requirement is assessed as <u>P</u>ass, <u>F</u>ail, or <u>N</u>ot <u>A</u>pplicable)

- 2.1. The study clearly identifies the scope of the work (i.e. which activity's Footprint is being assessed in the study. For example, this can be the final consumption of a national population, a regional or city population, or a household; it can also be the provision of a service or (finally consumed) product), or it can be a specified set of activities within an organization.
- 2.2. The study makes clear that a Footprint assessment as any other resource tracking framework analyzes activities, which can be activities of production or consumption. (Note 2A)
- 2.3. The study boundaries are specifically and unambiguously defined. (Note 2B)
- 2.4. The study specifies which Footprint perspectives (e.g., resource extraction Footprint, economic production Footprint, consumption Footprint, trade Footprint etc.) are used in the analysis, and clearly differentiates among them
- 2.5. The study explicitly addresses how it avoids double-counting of areas. (Note 2C)
- 2.6. The assessment accounts for the full life-cycle demands on resources used. This is established either by using appropriate embodied Footprint data from the National Footprint Accounts, or by using techniques that take into account impacts of all upstream production processes (e.g., data from an LCA or IO analysis). (Note 2D; for exceptions see Note 2E)

Notes:

(2A) The Footprint measures demand on nature, which results from specific human activities. It is the actions of an entity (person, city, country) that creates the demand on bioproductive space. Thus, organizations per se cannot be analyzed, since it is not clear, which activities are associated with an organization and which ones are not (e.g., is the CO_2 emitted from company X's business, the CO_2 Footprint of the airline, of the oil company that provided the kerosene, of company X, or of company X's client company that is served by this business trip?). Yet the *activities* of organizations can be analyzed: for instance one can calculate the Footprint of generating and distributing the electricity sold by a utility company – which is

not the "Footprint of the utility." At present, there is no consensus regarding what activities should, or should not, be included in the Footprint of an organization.

(2B) If the study is done for a product or organization's activities, the boundaries are specifically and unambiguously defined. In the case of organizations, it may be appropriate to consider how a product or service influences the consumption footprint. (see also <u>note 2D</u>). There are various guidelines and approaches to setting boundaries; at this time it is not the intent of these Standards to specify any specific approach.

(2C) The same bioproductive land area should be counted only once even though it may provide two or more services. Because material flows are the basis upon which the Footprint is calculated, intermediates or inputs and outputs must not be double counted (e.g., counting the flour used to make bread and the bread itself; or counting paper when it's purchased and again when it's recycled Or, if intermediates are double counted, the part that is (or potentially is) double counted must be identified.

(2D) If the study looks at the Footprint associated with an organization's activities (Note 2A), it might be more productive to propose a "circle of influence for Footprint reductions" approach rather than a "Footprint of the organization's activities" approach for determining boundaries. For example, even though a product or service might appear to have a high Footprint, use of that product or service might reduce the total consumption Footprint by replacing a higher Footprint process, resulting in a net reduction in Footprint. IO addresses the boundary issue from one particular perspective, namely, if the question is: "what are the resource flows associated (directly and indirectly) with sales for final consumption?" This question can also be addressed with other methods, depending on categories to be analyzed, requisite level of accuracy, and precision required for the study. A detailed LCA analysis, with accompanying life cycle inventory, may also provide an accounting of the upstream impacts, in a more direct manner than IO analyses based on monetary IO data.

(2E) In the case of intermediate demand (e.g., Footprint of a business' activities), full life cycle accounting may not be possible. If so, this must be noted, with explanations, and <u>Standard 2.6</u> should be marked as "Not Applicable". When <u>Standard 2.6</u> cannot be met, it is very probable that <u>Standard 3.2</u> cannot be met either, as it may not be possible to eliminate overlapping boundaries

Standard 3: Sub-National Population Calculations

Intent:

To ensure that Sub-National Footprint results can be compared when assessed using the same boundary definitions.

Additional Information:

The European Common Indicators Project (ECIP) evaluated early Footprint studies, and reports from this activity informed decisions made in establishing these standards. In particular, the project identified numerous areas where lack of agreement on common components and boundary conditions resulted in Footprint studies that could not be compared with each other. Links to these reports, and other methods of assessing a Consumption Land Use Matrix, may be found in the <u>technical references</u>.

Boundary issues present challenges in environmental assessments. While the problem is somewhat reduced when calculating consumption Footprints at the National level, trade is a complicating factor in drawing clear boundaries. Sub-National Population calculations introduce analytical difficulties not present at the National level; organizational Footprint assessments introduce still more challenges. It is important to distinguish between regional population consumption studies (States, Counties, Cities), which can generally be treated in a similar manner, and organizational studies, which introduce quite different problems than the regional population studies.

In particular, when conducting assessments on the activities of companies, there are multiple overlapping life cycles (for example, the steel producer uses trucks made from steel made from ore transported by the trucks using fuel extracted from the earth using steel drilling rigs). These overlaps increase the risk of double counting when assessing the Footprint. This problem can be reduced by drawing explicit boundaries for the study (<u>Standard 2</u>). (Note 3A)

Requirements:

- 3.1 The study calculates (and presents) sub-national Footprints by adapting the national per capita Consumption Land Use Matrix to the sub-national population under consideration (Notes <u>3B</u>, <u>3C</u>). Adjusting the national Consumption Land Use Matrix to the sub-national population can be done by various methods (e.g., allocation based on supplementary consumption statistics, LCA, IO) consistent with these standards.
- 3.2 The method used to populate the Consumption Land Use Matrix, and to calculate the Sub-National Population Footprint, is consistent with the National Footprint Accounts, so that when applied to all non-overlapping sub-national regions, the sum of regional results equals the National Footprint Accounts national results for Footprint and Biocapacity. (Note 3A)

3.3 The study needs to make explicitly clear what proxies/methods are used to construct sub-national accounts (e.g. expenditure on petrol or car ownership as a proxy for private transport).

Notes:

(3A) As noted in <u>2A</u>, Ecological Footprint method applies to activities, not organizations such as companies, industry sectors, production plants etc. In the case of production chains, it is important to recognize that Footprints of all intermediate demand Footprints do not add up to the final demand Footprint, because their activities may have overlapping Footprints (e.g., the Footprint of baking bread overlaps the Footprint of milling flour. Flour is used in making bread, hence summing the Footprints would lead to double counting the milling Footprint.). The sum of the Footprints of all business activities will be larger than the Footprint of the economy as a whole, due to double counting along the production chain of goods and services. Since this overlap exists, <u>Standards 3.2</u> and <u>6.2</u> are usually not applicable to Footprints of business activities. Most Footprint applications focus on the activity of "final consumption" or a particular population.

(3B) **Guideline:** Consumption Land Use Matrix Suggested Top-Level Components (see also Standard 6: Consistency of Components). Note that for Footprint studies of organizations, which are in the middle of the supply chain, defining consumption may be difficult. None the less, reporting data in this format is a useful tool in identifying the magnitude of an organization's impact on various land types. For organizations, the consumption categories below may not be appropriate, and for such studies the practitioner and client should negotiate appropriate categories. As noted previously, Ecological Footprint Standards 2.0 will include a more detailed treatment of organizations.

	Built-up Land	CO ₂ Area	Cropland	Grazing Land	Forest	Fishing Ground	Total
Food							
Shelter							
Mobility							
Goods							
Services							
Total							

(3C) As of 2005, Consumption Land Use Matrices are not included as part of the National Footprint Accounts – only a sample template is included. But such matrices have been developed for several countries. Global Footprint Network encourages users in each country to use one common matrix to increase consistency. If the Consumption Land Use Matrix does not exist, or there is reason to believe that the existing Matrix is outdated or inadequate, the study must develop the National Consumption Land Use Matrix as part of the Sub-National Footprint Study.

STANDARD 4: (Place holder for organizational and product studies --Not released)

Standard 4 will address requirements for organizational and product Footprint studies. Anticipated release date is Q3 2007.

Standard 5: Derivative Conversion Factors

Intent:

To ensure that all conversion factors used in Footprint calculations are consistent with the National Footprint Accounts.

Additional Information:

The National Footprint Accounts provide all the primary conversion factors describing the area demand of primary activities (apart from those aspects not yet covered by the current accounts). If more detailed (secondary) factors are needed, for instance of products that are made from a number of input factors, these may be calculated using the conversion factors for primary resources as provided by the National Footprint Accounts. Calculations for these newly derived factors must be clearly documented.

If National Footprint Accounts do not provide the necessary factors, or the available factors lack specificity needed for the assessment, data from life-cycle analyses or other sources may need to be used. However, it is important to remember that household consumption only captures a limited part of the overall consumption of a society (typically 40 percent of consumption is attributable to non-household activities such as infrastructure, universities, policing, hospitals etc.). Therefore, household consumption needs to be adjusted to capture associated resource consumption not immediately part of the life-cycle. Various approaches may be used to allocate this overhead consumption.

Requirements:

(Each requirement is assessed as <u>P</u>ass, <u>F</u>ail, or <u>N</u>ot <u>A</u>pplicable)

- 5.1 Secondary conversion factors are derived from the primary conversion factors in the National Footprint Accounts. (Note <u>5A</u>)
- 5.2 Calculation methods for any derived conversion factors are clearly documented (e.g., data source given, method of calculation described, discussion of indirect or life-cycle effects included in the factor, description of boundaries compliant with Standard 2).
- 5.3 When a conversion factor cannot be derived from the existing primary conversion factors, the calculation of the needed conversion factor is treated as a Non-Standard Element (see Standard 7).

Notes:

(5A) In calculating derivative conversion factors, a variety of methods could be used. It is the responsibility of the study to ensure that the results are consistent with the National Footprint Accounts data.

Standard 6: Consistency of Components

Intent:

To make reports comparable worldwide by ensuring that consumption components and subcomponents are consistent with National Footprint Accounts and mutually non-overlapping.

Additional Information:

The consumption components for Footprint results are:

- **Food** (e.g. consumption areas associated with (the chain of) food production)
- Shelter (e.g. domestic energy and land use and consumption areas associated with the construction industry)
- **Mobility** (e.g. fuel and land use for private transport and consumption areas associated with provision of public transport)
- Goods (e.g. consumption areas associated with products of the manufacturing industry)
- Services (e.g. consumption areas associated with provision of public and private <u>services</u>)

The above components can be broken down into sub-components as needed to provide the desired level of detail. For example, "Mobility" can be subdivided in sub-components such as private automobile, public transit and air travel; public transit can be further expanded to reflect bus, light rail, etc.

'Waste' must not be treated as a separate component, but a subset of other components (i.e., waste is a stage in the lifecycle of every product, so waste is a function of each lifecycle rather than a separate component). However, waste management can be a sub-component of Services, or gains from recycling can be a sub-component of Goods.

In some cases the analysis may require components other than the guideline components in the Guideline Consumption Land Use Matrix to answer a specific Footprint question. In such cases, the report must clearly identify any non-standard components, or any allocation that differs from the recommendation of this Standard (see <u>Standard 7</u> for further requirements for non-Standard elements).

Best Practice Recommendation: To ensure consistency and comparability, use an official classification system for subcomponents. For the consumption Footprint for example, one possible classification system is COICOP (Classification of Individual Consumption according to Purpose), which in turn is consistent with National Accounts (at least in developed countries). Classification system components can be aggregated to the components mentioned above. While a different breakdown is conceivable as well (E.g. "Energy" could be shown separately) in order to maintain comparability use of the components listed above is recommended.

At present these categories do not necessarily address the specific needs of organizational studies. Appropriate alternate categories for organizational studies will be developed and released in the Ecological Footprint Standards 2007.

Requirements:

(Each requirement is assessed as <u>P</u>ass, <u>F</u>ail, or <u>N</u>ot <u>A</u>pplicable)

- 6.1 The study reports results in Consumption components and sub-components that are consistent with National Footprint Accounts.
- 6.2 The study ensures that components are non-overlapping and exhaustive. (See also <u>note 3A</u> regarding studies of organizations)
- 6.3 The report explains the consumption components.
- 6.4 The study clearly identifies which items are included in which component. (Note 6A)

Notes:

(6A) In some cases, the source data may not permit disaggregating data sufficiently to allocate subcomponents as recommended in the Additional Information discussion. For example, in the case of Food, the recommended practice is to include food packaging and food transport Footprints in the Food component. However, due to source data limitations, it may be appropriate for a study to group all packaging and transport into a single category, such as goods, rather than reporting them in both the Food and Goods categories. This is permissible. The intent is that allocation of subcomponents is documented and unambiguous.

Standard 7: Use of Non-Standard Elements in Footprint studies

Intent:

To ensure that if the Footprint assessment either adds new elements to, or omits elements from, the standardized Footprint elements, these differences are identified and explained.

Additional Information:

For comparability, each Footprint assessment needs to include a way to compare itself to the National Footprint Accounts. However, there may be reasons for adding to or leaving out aspects of the National Footprint Accounts in a particular Footprint application. These additions or omissions must be clearly documented both to avoid inappropriate comparisons and to identify where the method is not compliant with the Standards.

When a Footprint assessment deviates from the Standards, it must identify which aspects are consistent with the Standards, and which are not. Non-standard methods should be described in detail, explaining the underlying philosophy and purpose as well as documenting the calculation procedures. So long as the study clearly identifies the non-standard elements, and shows how these elements change the Footprint compared to a Standard-compliant analysis, the study can be certified. (Note 7A)

When these non-standard methods advance the utility of Footprint analysis, they will be reviewed by the various Standards Committees and may be integrated in the next generation of National Footprint Accounts and Standards. In this way, the Network encourages creativity and explorations that will help to make the method even more valid and reliable.

Requirements:

- 7.1. The study explicitly identifies elements added or omitted as compared to the standard National Footprint Accounts.
- 7.2. The study provides transparent documentation of the calculation method used for added elements.
- 7.3.If new elements are added, the study presents the results with and without these elements, so that a direct comparison of results to other Standardized results can be made.
- 7.4. If standard elements are omitted, the study explains why they are omitted, and how this affects the comparability of the results to other studies. (Note 7A)

Notes:

(7A) It is not necessary to analyze all Footprint components to comply with these Standards, as long as the Footprint boundaries are clearly drawn and the relevant components identified. For example, an assessment of the Footprint of milk served in a school might only require the Food component, but not require an assessment of Fishing ground.

Nor is adding a component prohibited. A consumption Footprint of a city may decide to include the CO2-equivalent for CH_4 emissions from a city dump in their assessment of CO_2 land. As long as the report provides results for CO_2 land both with and without the CH_4 's CO_2 -equivalent value, the study may be certified. Accurately defining the study scope and boundaries is critical in these cases.

STANDARD 8: (Place Holder for calculation methods Not Released)

Standard 8 will address requirements for calculation methods used in Footprint studies. Release date is not yet determined.

Standard 9: Error Estimates (GUIDELINE)

Intent:

To give a sense of the precision of Ecological Footprint results and to make comparisons of results more meaningful.

Additional Information:

The provision of error margins enables a more meaningful comparison between results. They allow a judgment whether differences in Ecological Footprints are real or only ostensible. An estimation of the precision should also increase the credibility of the Ecological Footprint. Unfortunately, National Footprint Accounts depend on data inputs that mostly lack information about error margins. Hence the national results cannot be bracketed with error margins

It is important to recognize that this guideline addresses errors in the source data, or errors introduced as a result of analytical limitations (e.g., truncation errors or unavoidable double counting because information is lacking). It does not address methodological errors, such as double counting of demand or production elements when these are separable.

Best practices call for a discussion of sources of error in the report and the availability of data on error margins, even if the quantitative estimates of the error are not available.

Guidelines:

- 9.1.If possible, final results of Ecological Footprint calculations should be presented with an estimated error margin.
- 9.2.If possible, an estimate of the following types of error should be given:
 - a. data source error (from collection etc, basically the baseline error of the raw data and coefficients used)
 - b. errors associated with proportionality assumptions (e.g. based on physical or based on monetary flows)
 - c. aggregation errors (these apply whenever data for a broad component is applied to a more specific subcomponent, and they apply in principle to both process-type and input-output methods)
 - d. errors associated with the truncation of upstream as well as end-of-life stages of the life-cycle
- 9.3.For each error type a statement should be made regarding whether the error is assumed to be a random or a systematic error (for example a truncation error is systematic, most source errors are random).
- 9.4.A description of how the estimates were derived is included; references to and adoptions from other studies are possible.

Standard 10: Traceability to National Footprint Accounts

Intent:

To ensure that the report clearly identifies whether or not the report is consistent with the most recent National Footprint Accounts.

Additional Information:

The National Footprint Accounts follow a consistent methodology, and understanding this methodology is essential to avoid misinterpreting Footprint results. The methodology paper is reviewed on an annual basis and revised as needed. The current version of the paper is located at <u>www.footprintstandards.org</u>.

Requirements:

(Each requirement is assessed as <u>P</u>ass, <u>F</u>ail, or <u>N</u>ot <u>A</u>pplicable)

- 10.1 The report references the National Footprint Accounts edition, version and data year (<u>Note 10A</u>) used in the analysis.
- 10.2 The National Footprint Accounts edition referenced is current with latest National Footprint Accounts edition that was available at the time when assessment was initiated or later edition. In no case is the National Footprint Accounts edition more than 2 years old. However, it is permissible to use a previous year's data using the latest Edition (e.g., years prior to 2002 using the 2005 Edition) to ensure that the National Footprint Accounts data set is from the same period as other data used in the assessment.
- 10.3 The report contains references to appropriate reference papers, including but not limited to the most current version of the methodology paper available at www.footprintstandards.org.

Notes:

(10A) The National Footprint Accounts are updated on an annual basis. This ensures that the National Footprint Accounts use the most complete data sets available – source data may change as databases are corrected, or additional information is added, or industry classifications are modified. Use of an older Edition may result in Footprint assessments that are not comparable to those using the current Edition. Because each Edition can calculate the Footprint for any previous year, it is necessary to specify which data year is used in the assessment. This means that if an assessment uses other data sets that are not updated as rapidly or as frequently as the National Footprint Accounts data sources, it is possible to match the data sets for the appropriate periods.

The National Footprint Accounts (as of 2006) include back-cast data – the results of applying the current methodology to the updated data sets in the National Footprint Accounts –to help explain changes in Footprint that occur because of methodological and source data changes.

Standard 11: Glossary, Definitions and Versions

Intent:

To ensure that the study provides the reference information needed both for traceability and auditing of results, and for understanding the technical language specific to Footprint studies.

Additional Information:

In order to keep terms and definitions consistent within the Network, all standardized reports need to use the same <u>glossary</u> (available from <u>www.footprintstandards.org</u>).

Requirements:

- 11.1 The study includes a glossary or definitions for key terms, including Ecological Footprint, Biocapacity, global hectares, yield factors, equivalence factors, and Footprint components.
- 11.2 The study uses these terms consistently.
- 11.3 The report explains land types.
- 11.4 The study glossary is consistent with the Global Footprint Network <u>glossary</u> available on the Standards website (<u>www.footprintstandards.org</u>)

Standard 12: Separation of Analytical Footprint Results from Normative or Values-based Interpretations

Intent:

To ensure that the analytical, science-based Footprint results are recognized and accepted as valid, the Footprint report clearly distinguishes between analytical results from the Footprint measurement and any conclusions, interpretations or recommendations relating to policy, planning or practice.

Additional Information:

In the financial world there are two separate functions: accounting (documentation of what is), and financial planning (strategies for how to reach a goal). In Footprint assessments too, analysts need to be clear about what part of the study is documentation/analysis, and what part is recommendations for action. Certification only applies to the analytical part of a Footprint analysis. Certification does not assess or validate recommended actions. However, only studies that do not confound accounting and recommendation can be certified.

Descriptive statements such as "we humans are using 1.2 planets" or "The per capita US Footprint is 5 times larger than the capacity that exists per person on this planet" are admissible and encouraged. They are powerful in themselves, and lead people to formulate their own conclusions about the nature of the problem, and ethical or moral implications of resource use. Such practices translate into statements like: "x global hectares exist per person. In contrast, this population uses y global hectares per person." (Yet stating, for example, "the fair share is x hectares per person" would not qualify for certification).

Requirements:

(Each requirement is assessed as <u>P</u>ass, <u>F</u>ail, or <u>N</u>ot <u>A</u>pplicable)

- 12.1 The report includes an estimate of the global biocapacity in gha per person.
- 12.2 The report explains the difference between global biocapacity and regional or local biocapacity. (<u>Note 12A</u>)
- 12.3 The report explains that the Footprint analysis compares human demand on the earth's biocapacity to the available biocapacity, i.e., an accounting of biocapacity supply vs. demand, given current technology and consumption patterns.
- 12.4 The Footprint report explains that the Footprint measures the demand of activities (producing, using, consuming).
- 12.5 The report makes clear that the Footprint is an ecological accounting tool, and as such, may inform choices but does by itself not advocate nor promote any particular strategy, policy, or solution. It is not predictive but can be used to assess certain pre-determined scenarios.

Any discussion that implies rights to, or limits on rights to, a given per capita Footprint (as for example in phrases such as Fair share, Fair Earthshare, equitably allocating, etc.) is kept clearly distinct from the analysis and not presented as a necessary conclusion of the methodology nor attributed to Global Footprint Network. Descriptive statements comparing per capita demand to per capita capacity do not violate this requirement, nor do any statements clearly identified as the opinion of the report's author. Discussion of rights, or limits on rights, that are codified in law, does not violate this requirement.

Guidelines:

- 12.6 Best practices include statements comparing actual consumption to global averages and availability. They also report on national or regional biocapacity.
- 12.7 Best practices include discussion of the ramifications of global and local capacity, as well as discussion related to import/export of demand and biocapacity. (See also notes 13A and 13B in Standard 13 for additional discussion)
- 12.8 Best practices may outline possibilities and options for action, yet does not endorse. It analyzes the current situation, and compares this with alternative scenarios, or identifies opportunities.
- 12.9 Best practices use the Footprint to stimulate people's creativity and encourage participation. In many cases where Footprint is being used, it is more effective to focus on the consumption dilemma and range of possible solutions, rather than advocating particular solutions or support for a particular interest (Note 12B). By using the Footprint to provide data, it helps invite people to the table and build consensus around the concern about ecological overshoot. This approach generates questions and asks participants, be they cities, businesses or individuals, for participation and for contributing their solutions.

Notes:

(12A): The report makes Footprint comparisons that are based on global biocapacity, reported in global hectares (gha) or global acre (gac). Global comparisons are necessary, because the Footprint is grounded on global biocapacity and global demand. The report can also use standardized local hectares as long as the conversion into global hectares is provided. Local hectares, such as Dutch hectares, would show the biocapacity per average Dutch hectare. In a given year, each Dutch hectare would be worth a constant, fixed amount of global hectares

(12B): For example, the term 'fair earthshare' raises the following concern: While the Footprint provides a powerful framework for describing social resource (in)equity within the context of global limits, using interpretative words like 'fair earthshare' can muddle description with prescription. Separating analysis from judgment makes the analysis far more powerful. It lets the analysis speak for itself. At the same time it also provides more support for those who want to use Footprint results for their interpretations. Early Footprint (and environmental space) analysis ran into unnecessary barriers and controversies by mixing what the analysts thought is fair with the analysis of what is happening now. This allowed contrarians to attack the analysis, thereby also undermining the arguments of the interpreters.

Standard 13: Footprint Scenarios

Intent:

The Ecological Footprint is presented as an ecological accounting tool, and not as a predictive model. Nevertheless, it can be applied in predictive modelling by translating scenario results into Footprint equivalents.

Additional Information:

The Ecological Footprint is an ecological accounting tool. The Footprint's technical integrity is grounded in the fact that the Footprint assesses past consumption and biocapacity, based on actual production and consumption data (see also <u>Standard 12.3</u>). The Footprint does not attempt to predict future consumption or biocapacity, nor predict technological innovation. It just documents what is.

However, one of the valuable tools for evaluating and evolving policy recommendations is the use of Footprint scenarios. Scenarios are Footprint analyses of hypothetical situations, based on explicit starting assumptions. These assumptions may be more or less valid, and, like all forward looking statements, scenarios are speculative because the underlying assumptions are subject to change.

At present there are no commonly agreed to methods for developing and applying scenarios within the Ecological Footprint.. For this reason, these standards do not include specific requirements for evaluating the quality of a scenario.

Requirements:

- 13.1 If scenarios are used, the report distinguishes between the underlying Footprint analysis, and any scenarios evaluated as part of the study.
- 13.2 The report makes clear that scenarios are not predictions of the future, but rather assessments of what would be the Footprint consequences if a given set of conditions are met.
- 13.3 When scenarios are used, they are conducted and described in a manner consistent with these standards.

Standard 14: Footprint Study Limitations

Intent:

To ensure that Footprint analyses clearly identify the research question, the study's limitations, the method used, and the method's limitations, so that results are not misinterpreted.

Additional Information:

The Footprint measures the percentage of the biosphere's bioproductive capacity occupied by a given human activity. This activity could be anything ranging from the entire human demand on the planet down to the production of one pencil. Clearly stating the research question helps the reader understand what aspect of this demand the Footprint assessment is addressing, and what it is not.

The national Ecological Footprint accounts are constructed so as to not exaggerate human demand on nature. In other words, they have a bias toward underreporting. More specifically, this means that some types of demand are not included for lack of data (e.g., waste absorption, freshwater use or acid rain), and, for some included aspects of demand, conservative conversion factors are used (e.g., the CO_2 method of fossil fuel use accounting is conservative compared to other possible approaches that calculate fossil energy use in terms of fuelwood, biomass energy or food production).

Because the Footprint measures supply by measuring the actual productivity of the various land types, the Footprint does not directly incorporate the impact of environmental pollutants, such as Hazardous Air Pollutants (HAPs), heavy metals, or Persistent Organic Pollutants (POPs), nor does it directly incorporate land disturbance. If environmental pollutants or land disturbance are a significant part of the study, they must be assessed using other methods, or treated as a non-standard element of the study. (Note 14A)

Requirements:

(Each requirement is assessed as <u>P</u>ass, <u>F</u>ail, or <u>N</u>ot <u>A</u>pplicable)

- 14.1 There is an explicit mention of the research question that the Footprint is attempting to answer (i.e., how much of the bioproductive capacity of the biosphere is occupied by a given activity?)
- 14.2 The statement of the study's limitations is complete, clear and accurate, with study boundaries clearly identified. See <u>Standard 2</u> for additional discussion.
- 14.3 The report discusses the factors affecting the accuracy and precision of the results.
- 14.4 The report notes that Footprint assumptions are conservative, i.e., more likely to underestimate the Footprint and overestimate biocapacity. The following text, or a paraphrase of this text, meets this requirement: *"National Footprint Accounts are managed so that, when in doubt, they*"

"National Footprint Accounts are managed so that, when in doubt, they underestimate the Footprint and overestimate the available biocapacity. For

example, many waste streams are still excluded for lack of adequate data, and optimistic carbon sequestration rates are used for calculating the carbon Footprint."

14.5 The report explains that the Footprint and biocapacity measure historical demand and supply, respectively, and cannot predict future biocapacity and consumption. The following text, or a paraphrase of this text, meets this requirement: "The National Footprint Accounts are based on the actual consumption and production data reported by United Nations statistical agencies in annual updates. Ecological Footprint assessments analyze both actual demand on biocapacity and available biocapacity for a specified year. Ecological Footprint accounts reflect the analyzed year's consumption, land management and harvesting practices. The Ecological Footprint does not forecast future technologies, or energy supply mixes, or consumption patterns, or changes in land management practices, all of which will affect the Footprint in future years".

The report acknowledges that the Footprint does not address degradation of bioproductivity from any causes, as might arise from eroding or depleting soils, or from pollutants such as heavy metals or PCBs inhibiting bioproductivity. The following text, or a paraphrase of this text, meets this requirement:

"The Ecological Footprint does not analyze land use practices for degrading practices, or predict the impact of ecotoxic or bioaccumulative materials on bioproductivity. The Footprint only reports human demand based on actual yields from bioproductive land. Footprint accounts do not incorporate future impacts of pollutants or erosion. This would require assumptions about future impacts which are not yet robust and broadly accepted. Thus, the Footprint only detects degradation of biocapacity (through erosion, desertification or pollution) indirectly, as a declining trend in yields or an increasing trend in inputs, or both."

Notes:

(14A) Since the Footprint is a comparison of past demand against past biocapacity, the impact of pollutants or land change may be detected as a declining trend in biocapacity, such as smaller yield factors or increased natural loss factors. The Footprint is not intended to predict future changes in bioproductivity.

Standard 15: Explanation of link between Sustainability and Footprint

Intent:

To ensure that the Footprint is understood as only one necessary criterion of sustainability, and not an absolute indicator of sustainability.

Additional Information:

The requirement that humanity's Footprint be smaller than available global biocapacity is a necessary but not sufficient, condition for sustainability. (<u>Note 15A</u>)

Policy decisions regarding biodiversity, resource management, social well-being and other sustainability dimensions require consideration of factors beyond the Footprint. Footprint reports need to state clearly that Footprints are not complete sustainability measures.

Issues not directly related to the Footprint, such as social satisfaction, human health, the integrity of natural ecosystems, or the conversion and management of non-renewable resources such as minerals must be assessed using other tools.

Standards:

(Each requirement is assessed as <u>P</u>ass, <u>F</u>ail, or <u>N</u>ot <u>A</u>pplicable)

15.1 The report does not state or imply that the Footprint is a complete measure of sustainability.

15.2 It contains either the following standard language, or a paraphrased version: "The Ecological Footprint is an [ecological] accounting tool that compares a particular human demand on the Earth's biosphere in a given year to the available biological capacity of the planet in that year. It can also be compared to the biocapacity of a nation or a region in that year. The Ecological Footprint documents what has occurred - it provides a snapshot in time. It does not predict future demand or capacity, nor prescribe allocation.

The Ecological Footprint attempts to answer one central sustainability question: 'how much of the bioproductive capacity of the biosphere is used by human activities.'

To measure overall progress towards sustainable development, the Ecological Footprint needs to be complemented by other measures."

Guidelines:

(Each requirement is assessed as <u>P</u>ass, <u>F</u>ail, or <u>N</u>ot <u>A</u>pplicable)

- 15.3 The report explains that while the Footprint analysis measures biocapacity, it does not determine how much of the total biocapacity is available to meet human demand (Note 15B)
- 15.4 The report acknowledges that the amount of global biocapacity reserved for wildlife, and how such land is managed, does not have a scientifically rigorous determination. (Note 15B)

Notes:

(15A) Global sustainability requires that the global Footprint be less than or equal to the global biocapacity. However, because regions of the globe exchange trade, it is possible for local regions to have a Footprint greater than the local biocapacity, because the deficit is overcome by imports. However, from the standpoint of bioproductivity the earth is a closed system, and this imposes a maximum on the global demand. Exceeding this demand leads to overshoot, or using nature's resources faster than nature can regenerate them, which is not sustainable.

Also, comparison of a local population's Footprint to the local or regional biocapacity does not necessarily predict whether that Footprint could be sustained on a global scale. A small Footprint in a region of even smaller biocapacity might be sustainable on a global scale, while a large Footprint in a region with reserve biocapacity is not sustainably replicable either at a global level. Finally, it is possible for a local population to have a Footprint smaller than the local biocapacity, but because of exports still create local ecological overshoot through overharvesting.

(15B)The Footprint measures human demand on biocapacity. Since the Earth's bioproductivity is required to support all species on Earth, decisions on how much of the biocapacity can be used by humans is as much a values-based decision as it is a scientific analysis. For example, if humans consume 100% of the Earths biocapacity, then there is nothing remaining to support wildlife. As it is ultimately an ethical choice in what kind of biodiversity rich world humanity wants to live – or, from a minimalist perspective, how much biodiversity is absolutely essential for human life on this planet, best practices call for making the need for this choice clear to users of Ecological Footprint results. For recent discussions on the area needed to preserve biodiversity, and the challenges posed by human demand on land areas, see Ceballos et al. (2005) and Stokstad (2005).

Standard 16: Citation of sources and description of methodologies

Intent:

To ensure the transparency and credibility of the report, relevant sources are cited, and study methods are described.

Additional Information:

Data used in the analysis is either measured as part of the study, or taken from previous studies. If measured as part of the study, the methodology, and related limitations, must be described. If data is taken from other sources, these need to be cited, along with an estimation of data quality.

Requirements:

- 16.1 The report references relevant other work that is used to support the analysis and conclusions.
- 16.2 The report references all data sources used in compiling the Consumption Land Use Matrices.

Standard 17: Reference to Standards and Certifying Bodies

Intent:

To ensure that the standards and certification process is transparent.

AND

To ensure that Footprint reports can be independently checked for compliance to standards.

Additional Information:

In order to build and maintain confidence in the standards and certification process, the Ecological Footprint Standards and Certification protocols are posted on a publicly accessible website, <u>www.footprintstandards.org</u>. This site also has comment forms to permit public comment and suggestions to aid in improving the standards.

Requirements:

- 17.1 The Report confirms compliance to the Ecological Footprint Standards, and cites Standards edition number.
- 17.2 The Report references both the Ecological Footprint Standards and Certification protocols, with links to these documents at <u>www.footprintstandards.org</u>.
- 17.3 The Report provides contact information, including a reference to **www.footprintstandards.org** for additional information.

Standard 18: Communication style (**GUIDELINE**)

Intent:

To strengthen the influence, trustworthiness, and effectiveness of standardized Footprint assessments by increasing consistency in style, tone and messages.

Additional Information:

While Footprint reports need to be creative and explore ever new kinds of empowering applications, using common style sheets will help building the common Footprint "brand."

Guidelines:

- 18.1. Avoid Acronyms. For example: Rather than EF, say Footprint; rather than GFN, say Global Footprint Network or Footprint Network
- 18.2. Choose descriptive, accessible names and labels: for example, when explaining Footprint components and sub-components, use names that are not confusing (for example, do not use "waste" as a category, but rather "waste management" or "disposable goods" or whatever is actually meant by the sub-component).
- 18.3. Less is more. Keep things as simple and accessible as possible.
- 18.4. Avoid preachy, moralistic or judgmental tones: Be as descriptive as possible. Identify what is analysis and what is interpretation. Avoid unnecessary adjectives. Avoid terms like responsible or responsibility (particularly if there is no legal context or code). Rather say, "can be attributed to" or "is associated with". It reduces credibility to be judgmental or heavy-handed, and moralistic.
- 18.5. Consider as main message: not "reduce your Footprint" but "secure your wellbeing, and therefore safeguard ecological assets" (once readers will buy the importance of safeguarding ecological assets, they will choose/conclude themselves to reduce their Footprint. This is more powerful, lasting, respectful, and empowering than telling them to reduce their Footprint.
- 18.6. Be clear about questions that are being answered. When offering results and answers, make sure there is clarity what question is being answered. For instance, we need to make clear that Footprint is not a thing in itself but is shorthand for a particular research question, which is: How much of the biosphere do given activities occupy? Footprint is just one method for answering that question.
- 18.7. Use standard texts where possible. Avoids rewrites, use as much standard text as possible. Avoids reediting, and shows consistency. Check www.footprintstandards.org for standard texts you can use on particular aspects.
- 18.8. Be inviting: Make sure reader gets that you are on his/her side and want to make their life better—'we are all in this together." Avoid criticism or blame. Emphasize the seriousness of the problem, but maintain a positive and empowering tone.
- 18.9. Let readers be the heroes and let them choose. Avoid "should," "ought to," etc. Focus instead on clear results yielded by the method, and let them speak for

themselves. Generally choose language that has a positive rather than preachy tone. Be inviting).

References

There is a large body of <u>literature relevant to designing and conducting Footprint studies</u>. It is not the intent of these Standards to endorse any particular paper or method; inclusion in this bibliography should not be interpreted as endorsement of any particular method or paper.

Ceballos et al., 2005: Gerardo Ceballos, Paul R. Ehrlich, Jorge Soberon, Irma Salazar, and John P. Fay, Global Mammal Conservation: What Must We Manage? *Science* 22 July 2005: Vol. 309. no. 5734, pp. 603 – 607

Stokstad, 2005: Erik Stokstad, Global Analyses Reveal Mammals Facing Risk of Extinction, *Science* 22 July 2005: Vol. 309. no. 5734, pp. 546 - 547

Supporting Documents:

Ecological Footprint Glossary:

Why does the Footprint need Standards? (www.footprintstandards.org)

Certification Protocol

Footprint Standards Contributors

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