

# Concordance between FECS-CS and CICES V4.3

DRAFT – Research in progress

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## 1 Abstract

The recent mainstreaming of ecosystem services into international and national decision making has elevated the importance of developing an internationally-agreed statistical classification system. The Final Ecosystem Goods and Services Classification System (FECS-CS) and the Common International Classification of Ecosystem Services (CICES V4.3) represent different approaches to classifying ecosystem services. This paper compares and contrasts them by comparing (a) scope and fundamental principles and (b) what is included and excluded in each. The analysis finds substantial differences and similarities, which could be leveraged to serve as the basis for a rigorous internationally-accepted statistical classification.

This paper is accompanied by an MS Excel workbook containing the detailed concordance and several summary tables.

## 2 Acknowledgements

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## 3 Introduction

### 3.1 Context

The System of Environmental Economic Accounting (SEEA) framework is an international statistical standard that guides the compilation of consistent and comparable statistics and indicators to “*inform debates and guide policy related to the interrelationships between the economy and the environment*” (United Nations et al., 2014). One component of the SEEA, the SEEA-EEA (Experimental Ecosystem Accounting), is considered “experimental” since several concepts and measurement issues remain to be resolved. One of these issues is the classification and measurement of ecosystem services.

### 3.2 International statistical classifications

An international standard statistical classification of ecosystem services would contribute greatly to the measurement, classification and reporting within the SEEA-EEA framework. As such, it would not only provide guidance to researchers who measure ecosystems, but also to statisticians and economists who need to classify, analyse and report on aggregates and to users who will make decisions based on these aggregates.

Classification is a simplification of the “real world” and one’s interpretation of “real world” varies with discipline, ethical perspective and role in ecosystem accounting. An international classification must take into account these different perspectives to be globally acceptable.

According to the United Nations Statistical Commission (Hancock, 2013):

*“A statistical classification is a classification having a set of discrete categories, which may be assigned to a specific variable registered in a statistical survey or in an administrative file, and used in the production and presentation of statistics.”*

The purpose of an international statistical classification is to provide a standardized and consistent approach to classifying statistical data, with the objective of (a) supporting the compilation of statistics that are reasonably comparable between countries and (b) providing linkages to national (or existing) classifications for the same characteristics (adapted from Hancock, 2013).

Hancock (2013) further outlines ten “*Principles to consider when developing an international statistical classification*”. The following is an interpretation of these principles in the current context (direct quotes are from Hancock):

1. **Custodians:** Custodianship generally resides with the United Nations Statistics Division (UNSD). UNSD is required to present the proposed classification to the Expert Group on International Statistical Classifications to ensure best practices have been observed and that it is coherent with related classifications.
2. **Conceptual Basis:** The conceptual basis is a description of definitions, concepts and principles that guide categorization, structuring and interpretation. In terms of ecosystem services, this would also require a definition of the scope of classification. That is, a sufficiently detailed definition and description that would allow users to decide if (a) a candidate unit<sup>1</sup> was indeed an ecosystem service and (b) where to assign it in the classification structure.
3. **Classification structures:** This refers to whether a classification is flat or hierarchic. In a hierarchic classification, statistics assigned to more detailed levels can be aggregated to higher levels. In terms of ecosystem services, this requires consideration of the “kinds” of services, units of measure and whether measures (monetary or physical) can and should be aggregated.
4. **Classification types:** This distinguishes between international and country-specific classifications. An international classification provides a common framework for collecting and organizing information. That is, it should accommodate country-specific requirements even though all requirements may not be applicable to all countries.
5. **Mutual exclusivity:** Categories in a classification must be mutually exclusive. That is, any unit should only be classified to one category. “*A classification with categories which are not mutually exclusive will confuse users and not enable the statistical classification to be accurately and consistently used.*” In terms of classifying ecosystem services, this suggests that sufficient detail is required to ensure a common interpretation of the service, thus avoiding different interpretations in different contexts.
6. **Exhaustiveness:** A classification should be exhaustive for all possible units that the classification represents. That is, within the scope defined in the *conceptual basis*, all types of ecosystem services should be accommodated.
7. **Statistical balance:** This refers to the balance between the size and homogeneity of categories. To support aggregations (i.e., tabulation), it is best to have homogenous categories of similar size.
8. **Statistical feasibility:** It should be “*possible to effectively, accurately and consistently distinguish between the categories in the classification on the basis of the information available*”. Detailed coding tools (definitions, classification flow charts) are required to support effective classification.

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<sup>1</sup> The term “candidate unit” refers to a proposed concept (e.g., biodiversity, resilience), which would be subject to a rationale to decide if it should be classified as an ecosystem service or not.

9. **Classification units/statistical units:** The classification unit is the basic unit to be classified. Statistical units are the units of observation for which data are collected or derived. For ecosystem services, the classification unit and statistical unit are both an *ecosystem service*. Further specifying the *unit of measure*, which for ecosystem services vary greatly, would facilitate data collection and classification.
10. **Time-series comparability:** Comparability over time can be managed using correspondences that link versions over time.

These principles establish the basic requirements for an international classification of ecosystem services that would eventually be reviewed by the Expert Group on International Statistical Classifications.

### 3.3 Ecosystem Services

To measure how ecosystems contribute to human well-being, it is essential to have a rigorous classification of ecosystem services, based on classification principles and a conceptual understanding of the relationships between ecosystem services and well-being. It is also essential that such a classification is accepted by the international user community.

Recent mainstreaming of ecosystem services into international (e.g., through the Millennium Ecosystem Assessment (MA, 2005), SEEA-EEA, IPBES (Díaz et al., 2015) and SDGs (United Nations, 2015)) and national (e.g., through national development plans and biodiversity strategies) decision making has elevated the importance of developing an internationally-agreed statistical classification system. This is essential not only for international comparison, but also for supporting national governments in developing ongoing statistical systems for measurement and reporting. This requires convergence among (a) subject-matter experts on concepts, definitions and scope, (b) statistical experts on constructing a rigorous classification and (c) country experts to ensure the range of perspectives is included.

Two important concepts have already fostered a degree of convergence among experts and other stakeholders. These are the concepts of “final” ecosystem services (Boyd & Banzhaf, 2007) and the Ecosystem Services Cascade (Potschin & Haines-Young, 2011).

Boyd and Banzhaf (2007) note that previous definitions of ecosystem services were inconsistent and tended to confuse ecosystem processes, services (production) and benefits (welfare). To support measurement and classification, they define “final” ecosystem services as “*components of nature, directly enjoyed, consumed, or used to yield human well-being.*” That is, services are the end-products of nature—not the structures and processes that produce those end-products. Nor are they the benefits obtained from these services or the values attributed to these benefits. Although Boyd and Banzhaf provide one interpretation, the definition itself does not contain further detail on “components of nature”, “directly” nor “well-being”.

The Ecosystem Services Cascade distinguishes ecological structures from process that underpin the conditions required for the production of “final” ecosystem services. It also distinguishes ecosystem services from benefits that people receive from these services, and from the values that people place on these benefits.

FEGS-CS (Landers & Nahlik, 2013; United States Environmental Protection Agency, 2015) and CICES V4.3 (CICES, 2013) both apply the concepts of “final” ecosystem services and the Ecosystem Services Cascade.

FEGS-CS links environmental classes with final ecosystem goods and services (FEGS) and with beneficiaries. The National Ecosystem Services Classification System (NESCS) (United States Environmental Protection Agency, 2015) adopts the FEGS-CS environmental classes and sub-classes to demonstrate how economists may refine measurement and catalogue relevant flows of final ecosystem

services<sup>2</sup>. NESCS includes both the supply side (types of environmental and ecological end-products) and the demand side (economic and household uses and users, the latter being FECS-CS “beneficiaries”) of what NESCS calls “final” ecosystem services, following Boyd and Banzhaf (2007).

CICES (CICES, 2013; Haines-Young & Potschin, 2013) describes ecosystem outputs as they directly contribute to human well-being by providing a framework in which “*information about supporting and intermediate services can be nested and referenced*”. CICES has been embedded in ecosystem assessment work in Europe (Maes *et al.*, 2013), as well as in early documentation of the SEEA-EEA.

### 3.4 FECS-CS

FECS-CS applies five conceptual principles:

1. *“Defining, measuring, quantifying, valuing, and/or accounting for FECS requires a wholly collaborative effort among natural scientists and social scientists.*
2. *Environmental processes and functions produce potential FECS (i.e., stocks), while people, groups, or firms (hereon referred to as “individuals”) enjoy, use, or consume FECS.*
3. *Defining, identifying, and classifying a complete, but non-duplicative, set of FECS is the foundation that can be used as a transdisciplinary approach to measure, quantify, map, model, and value ecosystem services.*
4. *Because individuals enjoy, use, or consume FECS, an understanding of their beneficiary perspective is crucial to identify FECS and contribute to the framing of the research and implementation plan.*
5. *Until the environment is measured [by natural scientists] and beneficiaries can be identified and quantified [by social scientists], the FECS reported in these matrices are considered candidates.”*

FECS-CS also applies a decision flowchart to determine whether a candidate unit<sup>3</sup> for classification is a FECS or not. The flowchart asks if the candidate is:

- directly valued by the beneficiary?
- directly connected to both the lithosphere and hydrosphere?
- living?
- self-sustaining in the environment?
  - if not, is it an incidental by-product?
- a renewable natural resource within a human lifetime?

Answers of “Yes” to all the above questions result in the candidate unit being classified as a FECS. FECS-CS applies this conservative “scope of classification”. This excludes, in principle, some candidate units that are sometimes considered ecosystem services, such as carbon sequestration and cultivated crops.

FECS-CS links each of 21 FECS categories to 38 beneficiary sub-categories and 15 environmental sub-classes (**Table 1**). Within this three-dimensional matrix, FECS-CS identifies 589 “triplets” (environmental class by FECS category by beneficiary category) of potential final ecosystem goods and services (FECS). For example:

**Environmental sub-class:** 11. Rivers and Streams

**Beneficiary sub-category:** 0103 Livestock Grazers

**FECS:**

- **01 Water:** water suitable for livestock consumption
- **02 Flora:** non-cultivated vegetation for livestock consumption

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<sup>2</sup> This paper does not include NESCS in the concordance. However, doing so would provide additional insights.

<sup>3</sup> This is called a “potential good or service that is under scrutiny” in Landers & Nahlik (2013).

**Table 1 FECS-CS categories**

<b>Environmental Sub-classes</b>	<b>Categories used to organize FECS</b>	<b>Beneficiary sub-categories</b>
11 Rivers and Streams	01 Water	0101 Irrigators
12 Wetlands	02 Flora	0102 CAFO* Operators
13 Lakes and Ponds	03 Presence of the environment	0103 Livestock Grazers
14 Estuaries and Near Coastal Marine	04 Fauna	0104 Agricultural Processors
15 Open Oceans and Seas	05 Fiber	0105 Aquaculturists
16 Groundwater	06 Natural materials	0106 Farmers
21 Forests	07 Open space	0107 Foresters
22 Agroecosystems	08 Viewscapes	0201 Food Extractors
23 Created Greenspace	09 Sounds and scents	0203 Industrial Processors
24 Grasslands	10 Fish	0204 Industrial Dischargers
25 Scrubland/Shrubland	11 Soil	0205 Electric and other Energy Generators
26 Barren/Rock and Sand	12 Pollinators	0206 Resource-Dependent Businesses
27 Tundra	13 Depredators and (pest) predators	0207 Pharmaceutical and Food Supplement Suppliers
28 Ice and Snow	14 Timber	0208 Fur/Hide Trappers and Hunters
31 Atmosphere	15 Fungi	0301 Municipal Drinking Water Plant Operators
	16 Substrate	0302 Waste Water Treatment Plant Operators
	17 Land	0303 Residential Property Owners
	18 Air	0304 Military/Coast Guard
	19 Weather	0401 Transporters of Goods
	20 Wind	0402 Transporters of People
	21 Atmospheric phenomena	0501 Water Subsisters
		0502 Food Subsisters
		0503 Timber, Fiber, and Fur/Hide Subsisters
		0504 Building Material Subsisters
		0601 Experiencers and Viewers
		0602 Food Pickers and Gatherers
		0603 Hunters
		0604 Anglers
		0605 Waders, Swimmers, and Divers
		0606 Boaters
		0701 Spiritual and Ceremonial Participants and Participants of Celebration
		0702 Artists
		0801 Educators and Students
		0802 Researchers
		0901 People Who Care (Existence)
		0902 People Who Care (Option/Bequest)
		1001 All Humans

Source: Landers & Nahlik (2013)

\* CAFO = Concentrated Animal Feeding Operation

This results in 338 “sets” of FECS, emphasizing the fact that, for example, for Rivers and Streams to be beneficial to Livestock Grazers, both Flora and Water need to be supplied. In this case, two “triplets” are required to constitute one “set”.

### 3.5 CICES V4.3

CICES V4.3 (**Table 2**) describes “ecosystem outputs as they directly contribute to human well-being” (Haines-Young & Potschin, 2013). It further “provides a framework in which information about supporting and intermediate services can be nested and referenced.” It considers “final” ecosystem services as:

*“the outputs of ecosystems (whether natural, semi-natural or highly modified) that most directly affect the well-being of people. A fundamental characteristic is that they **retain a connection to the underlying ecosystem functions, processes and structures that generate them**”* (Haines-Young & Potschin, 2013).

CICES is considered a hierarchic classification, since categories at lower levels inherit properties from higher levels. Further, the structure has been designed so that categories at each level are mutually exclusive.

The highest level of organization is the three main Sections: 1. Provisioning Services, 2. Regulation and Maintenance, and 3. Cultural Services, which are defined as follows:

1. **Provisioning services:** *all nutritional, material and energetic outputs from living systems. In the proposed structure a distinction is made between provisioning outputs arising from biological materials (biomass) and water.*
2. **Regulating<sup>4</sup> and maintenance:** *covers all the ways in which living organisms can mediate or moderate the ambient environment that affects human performance. It therefore covers the degradation of wastes and toxic substances by exploiting living processes; by reconnecting waste streams to living processes it is in this sense the opposite of provision. Regulation and maintenance also covers the mediation of flows in solids, liquids and gases that affect people’s performance as well as the ways living organisms can regulate the physico-chemical and biological environment of people.*
3. **Cultural Services:** *covers all the non-material, and normally non-consumptive, outputs of ecosystems that affect physical and mental states of people.*

CICES is not intended to replace existing classifications and, as such, the authors provide correspondences between CICES and the classifications used by the Millennium Ecosystem Assessment (MA, 2005), TEEB and a national adaptation for Belgium (Turkelboom et al., 2013).

At the 4-digit level (See **Table 2**), CICES V4.3 describes 48 biotic ecosystem services classes. It also includes a provisional classification of 11 “abiotic outputs from natural systems”, such as **Nutritional abiotic substances** (e.g., salts) and **Renewable abiotic energy sources**.

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<sup>4</sup> The terms “regulating” and “regulation” are both used in the documentation.

**Table 2 CICES V4.3 Structure and classes (Part 1)**

**Biotic services**

Section	Division	Group	Class	
01. Provisioning Services	01.01 Nutrition	01.01.01 Biomass	01.01.01.01 Cultivated crops	
			01.01.01.02 Reared animals and their outputs	
			01.01.01.03 Wild plants, algae and their outputs	
			01.01.01.04 Wild animals and their outputs	
			01.01.01.05 Plants and algae from in-situ aquaculture	
			01.01.01.06 Animals from in-situ aquaculture	
			01.01.02 Water	01.01.02.01 Surface water for drinking
			01.01.02.02 Ground water for drinking	
	01.02 Materials	01.02.01 Biomass	01.02.01.01 Fibres and other materials from plants, algae and animals for direct use or processing	
			01.02.01.02 Materials from plants, algae and animals for agricultural use	
			01.02.01.03 Genetic materials from all biota	
			01.02.02 Water	01.02.02.01 Surface water for non-drinking purposes
				01.02.02.02 Ground water for non-drinking purposes
	01.03 Energy	01.03.01 Biomass-based energy sources	01.03.01.01 Plant-based resources	
01.03.01.02 Animal-based resources				
01.03.02 Mechanical energy		01.03.02.01 Animal-based energy		
02. Regulation & Maintenance	02.01 Mediation of waste, toxics and other nuisances	02.01.01 Mediation by biota	02.01.01.01 Bio-remediation by micro-organisms, algae, plants, and animals	
			02.01.01.02 Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and animals	
			02.01.01.03 Mediation of smell/noise/visual impacts	
			02.01.02 Mediation by ecosystems	02.01.02.01 Filtration/sequestration/storage/accumulation by ecosystems
				02.01.02.02 Dilution by atmosphere, freshwater and marine ecosystems
				02.01.02.03 Mediation of smell/noise/visual impacts
	02.02 Mediation of flows	02.02.01 Mass flows	02.02.01.01 Mass stabilisation and control of erosion rates	
			02.02.01.02 Buffering and attenuation of mass flows	
		02.02.02 Liquid flows	02.02.02.01 Hydrological cycle and water flow maintenance	
			02.02.02.02 Flood protection	
			02.02.03 Gaseous/air flows	02.02.03.01 Storm protection
				02.02.03.02 Ventilation and transpiration
	02.03 Maintenance of physical, chemical, biological conditions	02.03.01 Lifecycle maintenance, habitat and gene pool protection	02.03.01.01 Pollination and seed dispersal	
			02.03.01.02 Maintaining nursery populations and habitats	
		02.03.02 Pest and disease control	02.03.02.01 Pest control	
			02.03.02.02 Disease control	
		02.03.03 Soil formation and composition	02.03.03.01 Weathering processes	
			02.03.03.02 Decomposition and fixing processes	
		02.03.04 Water conditions	02.03.04.01 Chemical condition of freshwaters	
			02.03.04.02 Chemical condition of salt waters	
		02.03.05 Atmospheric composition and climate regulation	02.03.05.01 Global climate regulation by reduction of greenhouse gas concentrations	
			02.03.05.02 Micro and regional climate regulation	

**Table 2 CICES V4.3 Structure and classes (Part 2)**

03. Cultural Services	03.01 Physical and intellectual interactions with biota, ecosystems, and land-/seascapes [environmental settings]	03.01.01 Physical and experiential interactions	03.01.01.01 Experiential use of plants, animals and land-/seascapes in different environmental settings
			03.01.01.02 Physical use of land-/seascapes in different environmental settings
		03.01.02 Intellectual and representative interactions	03.01.02.01 Scientific
			03.01.02.02 Educational
			03.01.02.03 Heritage, cultural
	03.02 Spiritual, symbolic and other interactions with biota, ecosystems, and land-/seascapes [environmental settings]	03.02.01 Spiritual and/or emblematic	03.01.02.04 Entertainment
			03.01.02.05 Aesthetic
		03.02.02 Other cultural outputs	03.02.01.01 Symbolic
			03.02.01.02 Sacred and/or religious
			03.02.02.01 Existence
03.02.02.02 Bequest			

**Abiotic services (provisional)**

Section	Division	Group
04. Abiotic Provisioning	04.01 Nutritional abiotic substances	04.01.01 Mineral
		04.01.02 Non-mineral
	04.02 Abiotic materials	04.02.01 Metallic
		04.02.02 Non-metallic
	04.03 Energy	04.03.01 Renewable abiotic energy sources
		04.03.02 Non-renewable energy sources
05 Regulation & Maintenance by natural physical structures and processes	05.01 Mediation of waste, toxics and other nuisances	05.01.01 By natural chemical and physical processes
	05.02 Mediation of flows by natural abiotic structures	05.02.01 By solid (mass), liquid and gaseous (air)flows
	05.03 Maintenance of physical, chemical, abiotic conditions	05.03.01 By natural chemical and physical processes
06 Cultural settings dependent on abiotic structures	06.01 Physical and intellectual interactions with land-/seascapes [physical settings]	06.01.01 By physical and experiential interactions or intellectual and representational interactions
	06.02 Spiritual, symbolic and other interactions with land-/seascapes [physical settings]	06.02.01 By type

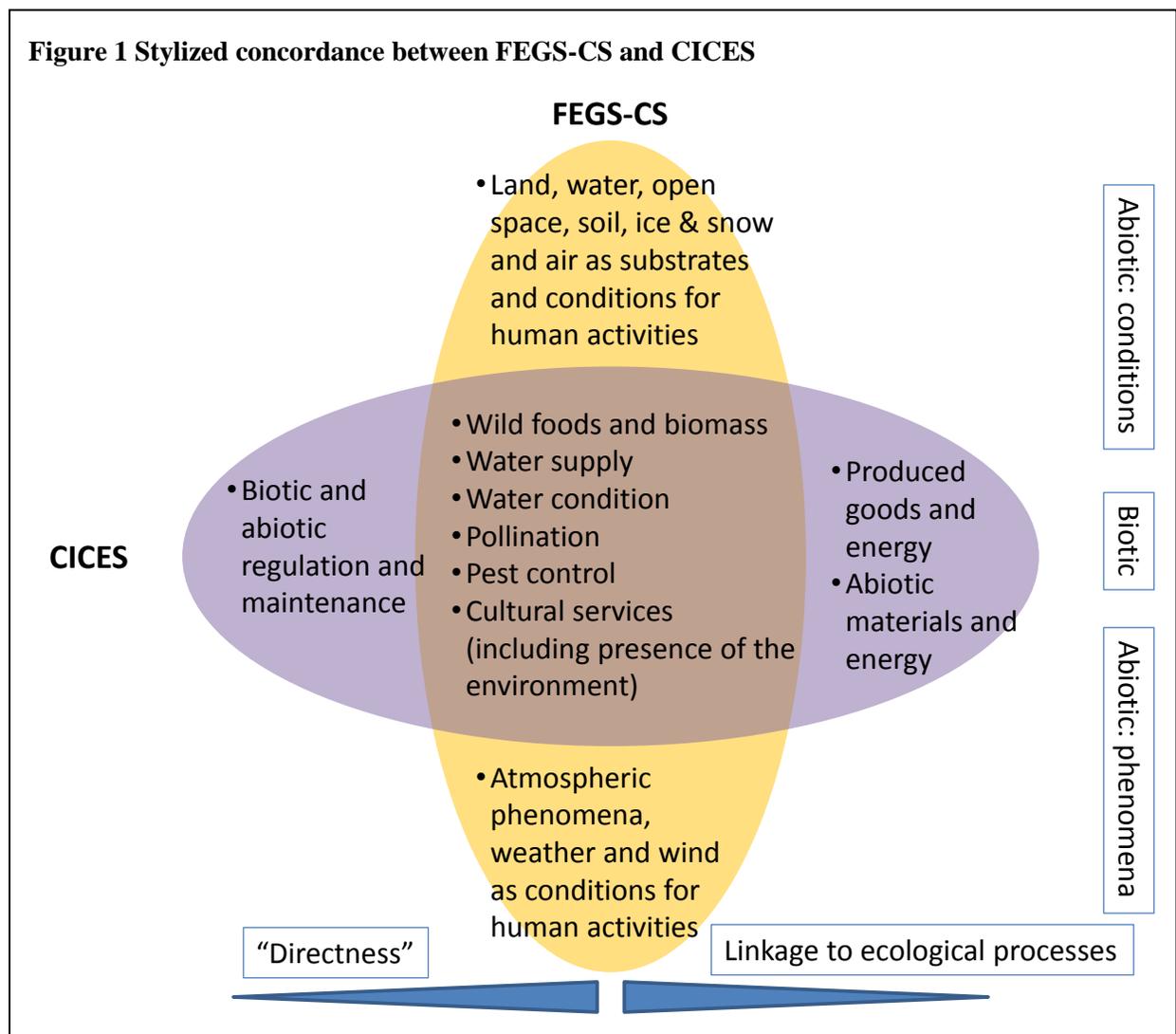
Source: CICES (2013); Numeric codes added by the author.

## 4 Comparison

### 4.1 Interpretation of conceptual differences

FEGS-CS and CICES V4.3 share a common definition of ecosystem services, however their interpretations differ. Differences in scope and treatment of abiotic services results in an incomplete concordance<sup>5</sup>. That is, 38 of 59 CICES classes are not represented in FEGS-CS and 119 of 589 FEGS triplets<sup>6</sup> cannot be represented in CICES (**Figure 1**). The intersection accounts for 470 of 589 FEGS triplets and 21 of 59 CICES classes (**Table 3**). The detailed concordance table is provided in **Annex 1**.

The left side of **Figure 1** is labelled “Directness” indicating that “Biotic and abiotic regulation and maintenance” applies a broader interpretation of “directly enjoyed, consumed and used” in CICES than in FEGS-CS. For example, flood control and carbon sequestration are important to maintaining ecosystems and are therefore interpreted in CICES as “final” services.



<sup>5</sup> Any reference to a 2-digit FEGS-CS code would be more accurately represented by an additional 6-digit code representing environmental sub-class and beneficiary sub-category. Given the differences in granularity, perfect correspondence is not possible.

<sup>6</sup> FEGS, for the purposes of the concordance are counted as individual occurrences (“triplets”) rather than as “sets”.

**Table 3 Summary of FECS-CS / CICES Concordance (number of units)**

		<b>FECS (n=589; 107+470+12)</b> <b>Abiotic conditions (n=107):</b> 01. Water (12) 03. Presence of the Environment (56) 07. Open Space (25) 11. Soil (5) 16. Substrate (1) 17. Land (8)	
<b>CICES (n=59; 21+21+17)</b>	<b>Regulation and Maintenance (21):</b> 02 Regulation and Maintenance (18) 05. Abiotic Regulation and Maintenance (3)	<b>Concordance CICES (n=21):</b> 01. Provisioning (8) 02. Regulation and Maintenance (3) 03. Cultural (9) 04. Abiotic provisioning (1)  <b>FECS (n=470):</b> 01. Water (56) 02. Flora (54) 03. Presence of the environment (146) 04. Fauna (78) 05. Fiber (15) 06. Natural materials (23) 08. Viewscapes (30) 09. Sounds and scents (30) 10. Fish (5) 12. Pollinators (3) 13. Depredators and (pest) predators (3) 14. Timber (9) 15 Fungi (14) 18. Air (1) 19. Weather (1) 20. Wind (2)	<b>Produced goods and energy (n=17):</b> 01. Provisioning (8) 02. Cultural (2) 04. Abiotic provisioning (5) 06. Abiotic cultural (2)
		<b>Abiotic Phenomena (n=12):</b> 18. Air (6) 19. Weather (4) 20. Wind (1) 21. Atmospheric phenomena (1)	
Although FECS are “sets” of environmental sub-class, FECS categories and beneficiary sub-class, the concordance was done on individual FECS triplets. The superset of FECS-CS and CICES units resulted in a table of 627 units. This includes 21 CICES classes which corresponded to 470 FECS, 38 CICES classes which corresponded to no FECS, and 119 FECS that corresponded to no CICES class ( $627 = 470 + 38 + 119$ ).			

The right side of **Figure 1** is labelled “Linkage to ecological processes” indicating that “Produced goods and energy” are dependent on ecosystem services, but are less directly linked to the underlying ecological processes. CICES includes several services that would not be considered “self-sustaining in the environment” in FECS-CS (e.g. Plants and animals from aquaculture) nor an “an incidental by-product” (e.g., cultivated crops and reared animals). The remainder of the differences relate to the treatment of abiotic services.

Following is a more detailed description of the similarities and differences. The concordance applies a narrow interpretation of both FECS-CS and CICES services. For example, FECS-CS environmental classes “Open Space” and “Presence of the Environment” could possibly be compared with a broader interpretation of CICES “Environmental Settings”. However, CICES “Environmental Settings” are under “Cultural services” and were interpreted as such.

## 4.2 In FECS-CS, not in CICES

FECS-CS applies a broader notion of “environment” (classified into environmental sub-classes) than is implied<sup>7</sup> in CICES and therefore includes a wider range of related, especially abiotic, services:

- **01 Water:**
  - as a medium for receiving industrial discharge,
  - saltwater as an input to processing edible products,
  - as a medium for cultivating aquatic organisms, and
  - as a medium for the transportation of goods and people
- **03 Presence of the Environment** as an opportunity for transportation, cultivating aquatic organisms, training activities, placement of infrastructure, discharging pollutants, and installing power generation structures
- **07 Open Space** to provide suitable conditions for military training activities, livestock grazing and holding, and growing trees and crops
- **11 Soil** as a substrate for agriculture
- **16 Substrate** includes **Ice and Snow** as a building material
- **17 Land** as a substrate for transportation
- **18 Air:**
  - as a medium for transportation of goods and people,
  - air quality as a contributor to recreational experience,
  - as a medium for industrial and agricultural discharges, and
  - as a basic input to human health
- **19 Weather** as a condition for establishing and maintaining property, forestry and farming activities, and livestock survival
- **20 Wind** as a condition for recreational activities (e.g., sailing)
- **21 Atmospheric Phenomena** as a contributor to recreational experience

This broader scope in terms of environmental sub-classes results in 119 (of 589) FECS that cannot, in principle, be represented in CICES.

## 4.3 In CICES, not in FECS-CS

Given the broader interpretation of “final” services in CICES, several CICES classes are not represented in FECS-CS. Many CICES “Provisioning Services” would be considered “not self-sustaining in the environment” and not “an incidental by-product” in FECS-CS:

- 01 Provisioning services<sup>8</sup>
  - 01.01 Nutrition
    - 01.01.01 Biomass
      - **01.01.01.01 Cultivated crops**
      - **01.01.01.02 Reared animals and their outputs**
      - **01.01.01.05 Plants and algae from in-situ aquaculture**
      - **01.01.01.06 Animals from in-situ aquaculture**
  - 01.02 Materials
    - 01.02.01 Biomass
      - **01.02.01.03 Genetic materials from all biota**
  - 01.03 Energy
    - 01.03.01 Biomass-based energy sources

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<sup>7</sup> CICES V4.3 environmental classes are not explicit, but considered “implicit” given descriptions of specific services.

<sup>8</sup> The coding numbers are added by the author. See **Table 2** for a complete listing. The detailed hierarchical presentation is necessary to illustrate the inheritance of properties in CICES.

- **01.03.01.01 Plant-based resources**
- **01.03.01.02 Animal-based resources**
- 01.03.02 Mechanical energy
  - **01.03.02.01 Animal-based energy**

Most CICES “Regulation and Maintenance” services are also out of scope for FECS-CS. However, there are approximate counterparts<sup>9</sup> for:

- 02 Regulation and maintenance
  - 02.03 Maintenance of physical, chemical, biological conditions
    - 02.03.01 Lifecycle maintenance, habitat and gene pool protection
      - **02.03.01.01 Pollination and seed dispersal (12 Pollinators in FECS-CS),**
    - 02.03.02 Pest control and disease control
      - **02.03.02.01 Pest Control (13 Depredators and (pest) predators in FECS-CS) and**
    - 02.03.04 Water conditions
      - **02.03.04.01 Chemical Condition of Freshwaters (01 Water as a medium and condition for cultivating aquatic organisms in FECS-CS).**

Of the 11 abiotic service classes suggested in CICES, only one has an equivalent in FECS-CS. That is:

- 04 Abiotic provisioning
  - 04.03 Energy
    - **04.03.01 Renewable abiotic energy sources** is represented by the FECS category **20 Wind** in terms of providing suitable wind speeds for electric power generation.

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<sup>9</sup> Note that CICES and FECS-CS focus on different aspects of these services. For example, CICES refers to “Pollination”, whereas FECS-CS refers to “Pollinators.”

## 5 Summary of the concordance

### 5.1 Many-to-one concordances

As indicated in the summary (Table 3, Figure 1), several FECS have no equivalent in CICES V4.3 and several CICES classes have no equivalent in FECS-CS. Further, there are several many-to-one and one-to-many concordances:

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FECS-CS distinguishes wild flora and fungi, whereas these are combined in one CICES class:

- 01 Provisioning services
  - 01.01 Nutrition
    - 01.01.01 Biomass
      - **01.01.01.03 Wild plants, algae and their outputs** (for food) is represented in FECS-CS by both **02 Flora** and **15 Fungi**
      - **01.01.01.04 Wild animals and their outputs** (for food) is represented in FECS by **04 Fauna** and **10 Fish**
  - 01.02 Materials
    - 01.02.01 Biomass
      - **01.02.01.01 Fibres and other materials from plants, algae and animals for direct use or processing** is represented in FECS-CS by **02 Flora**, **05 Fiber** and **06 Natural materials**

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CICES distinguishes the use of fibres for direct use (such as construction) and fuel:

- 01 Provisioning services
  - 01.02 Materials
    - 01.02.01 Biomass
      - **01.02.01.01 Fibres for direct use**
  - 01.03 Energy
    - 01.03.01 Biomass-based energy sources
      - **01.03.01.01 Fibres for fuel** whereas FECS-CS distinguishes the type (**05 Fiber** and **14 Timber**) but combines the uses (building and fuel).

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Genetic materials are treated differently:

- 01 Provisioning
  - 01.02 Materials
    - 01.02.01 Biomass
      - **01.02.01.03 Genetic materials from all biota (Biomass)** is only peripherally represented in FECS-CS via certain services associated with **02 Flora**, **04 Fauna** and **15 Fungi** for Pharmaceutical and Food Supplement Suppliers, however their use as genetic materials is not explicit in FECS-CS

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Water for non-drinking purposes is treated differently:

- 01 Provisioning
  - 01.02 Materials
    - 01.02.02 Water
      - 01.02.02.01 **Surface water for non-drinking purposes** concurs largely with the FECS **01 Water**, however it also covers one FECS associated with **19 Weather** (i.e., providing sufficient rainwater for livestock survival)

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CICES distinguishes between water as a material and the conditions of that water:

- 01 Provisioning
  - 01.02 Materials
    - 01.02.02 Water
      - **01.02.02.01 Surface water for non-drinking purposes** from
- 02 Regulation and Maintenance
  - 02.03 Maintenance of physical, chemical, biological conditions
    - 02.03.04 Water conditions
      - **02.03.04.01 Chemical condition of freshwaters,**

However, these are combined in several FECS associated with **01 Water** (as a medium and condition for boating)

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FECS-CS includes **12 Pollinators**, whereas CICES refers to “Pollination and seed dispersal”:

- 02 Regulation and Maintenance
  - 02.03 Maintenance of physical, chemical, biological conditions
    - 02.03.01 Lifecycle maintenance, habitat and gene pool protection
      - **02.03.01.01 Pollination and seed dispersal** is represented in FECS-CS as **12 Pollinators**

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CICES includes “pest control” whereas FECS-CS includes “Depredators and (pest) predators”:

- 02 Regulation and maintenance
  - 02.03 Maintenance of physical, chemical, biological conditions
    - 02.03.02 Pest and disease control
      - **02.03.02.01 Pest control** is represented in FECS-CS as **13 Depredators and (pest) predators**

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FECS **03 Presence of the Environment** corresponds with many CICES classes, and as noted above, is not completely represented in CICES:

CICES distinguishes:

- 03 Cultural
  - 03.01 Physical and intellectual interaction with biota, ecosystems, and land/seascapes [environmental setting]
    - **03.01.01 Physical and experiential interactions**, from
    - **03.01.02 Intellectual and representative interactions**
      - **03.01.02.04 Entertainment**, and
      - **03.01.02.05 Aesthetic** services, while these are combined in several FECS-CS categories (in terms of opportunity for reduced risk and placement of infrastructure for resource-dependent businesses)

CICES use of:

- 03 Cultural
  - 03.01 Physical and intellectual interaction with biota, ecosystems, and land-/seascapes [environmental setting]
    - 03.01.01 Physical and experiential interactions
      - **03.01.01.01 Experiential use of plants, animals and land-/seascapes in different environmental settings** is represented by several FECS-CS categories (**02 Flora, 03 Presence of the environment, 04 Fauna, 08 Viewscapes, 15 Fungi**, and **20 Wind**)

CICES distinguishes:

- 03 Cultural
  - 03.01 Physical and intellectual interaction with biota, ecosystems, and land-/seascapes [environmental setting]
    - 03.01.01 Physical and experiential interactions,
      - **03.01.01.02 Physical use of land-/seascapes in different environmental settings**, from:
- 02 Regulation and maintenance
  - 02.03 Maintenance of physical, chemical, biological conditions
    - 02.03.04 Water conditions
      - **02.03.04.01 Chemical condition of freshwaters**, whereas these are combined in several FECS-CS categories under **03 Presence of the environment** with respect to opportunities for boating and swimming

The CICES class of:

- 03 Cultural
  - 03.01 Physical and intellectual interaction with biota, ecosystems, and land/seascapes [environmental setting]
    - 03.01.02 Intellectual and representative interactions
      - **03.01.02.05 Aesthetic** is also represented by several FECS-CS categories (**03 Presence of the environment, 08 Viewscapes, 09 Sounds and scents, and 18 Air**)

## 5.2 Concordances

Of a total of 589 FECS triplets,<sup>10</sup> 470 concord with CICES classes, although several concordances are not precise:

- 01 Provisioning
  - 01.01 Nutrition
    - 01.01.02 Water
      - **01.01.02.01 Surface water for drinking** is represented by FECS-CS category **01 Water** from Atmosphere, Ice and snow, Lakes and Ponds for Water Subsisters and from Estuaries, Lakes and Ponds, and Rivers and Streams for Municipal Drinking Water Plant Operators.
      - **01.01.02.02 Ground water for drinking** is represented by FECS-CS category **01 Water** from Groundwater for Water Subsisters and Municipal Drinking Water Plant Operators.
  - 01.02 Biomass
    - 01.02.01 Materials
      - **01.02.01.02 Materials from plants, algae and animals for agricultural use** is represented by FECS category **02 Flora** in terms of non-cultivated vegetation for livestock consumption
    - 01.02.02 Water
      - **01.02.02.02 Ground water for non-drinking purposes** is represented by FECS-CS category **01 Water** in terms of water used in medicines or sold for medicinal purposes, water suitable for livestock consumption, water for growing and maintaining crops, water for processing edible products, water suitable for cooling or processing industrial products, water that can be used for (geothermal) energy generation, water for livestock consumption, medium and conditions (i.e., water quality) provided by the environment for cultivating aquatic organisms

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<sup>10</sup> Counted individually, not as “sets” and including the many-to-one and one-to-many concordances discussed above.

- 02 Regulation and maintenance
  - 02.03 Maintenance of physical, chemical, biological conditions
    - 02.03.01 Lifecycle maintenance, habitat and gene pool protection
      - **02.03.01.01 Pollination and seed dispersal** is represented by FECS-CS category **12 Pollinators**
      - **02.03.02.01 Pest control** is represented by FECS category **13 Depredators and (pest) predators**
    - 02.03.04 Water conditions
      - **02.03.04.01 Chemical condition of freshwaters** is represented by FECS-CS category **01 Water** in terms of water as a medium and conditions for cultivating aquatic organisms.
- 03 Cultural
  - 03.01 Physical and intellectual interaction with biota, ecosystems, and land/seascapes [environmental setting]
    - 03.01.02 Intellectual and representative interactions,
      - **03.01.02.01 Scientific** is represented by FECS-CS category **03 Presence of the Environment** in terms of research opportunities for researchers
      - **03.01.01.02 Physical use of land-/seascapes in different environmental settings** is represented by FECS-CS category **03 Presence of the Environment**, but only in terms of the opportunity and conditions for wading, swimming and/or diving. There are several instances where this CICES class is combined with others to represent other FECS.
      - **03.01.02.02 Educational** is represented by FECS-CS category **03 Presence of the Environment** in terms of opportunities to understand, communicate, and educate for educators and students
  - 03.02 Spiritual, symbolic and other interactions with biota, ecosystems, and land-/seascapes [environmental setting]
    - 03.02.01 Spiritual and/or emblematic
      - **03.02.01.01 Symbolic** is represented by FECS-CS category **03 Presence of the Environment** in terms of opportunity for a sensory experience [which may lead to the benefit of inspiration for art]
      - **03.02.01.02 Sacred and/or religious** is represented by FECS-CS category **03 Presence of the Environment** in terms of opportunity and conditions for spiritual and ceremonial practices and celebrations
    - 03.02.03 Other cultural outputs
      - **03.02.02.01 Existence** is represented by FECS-CS category **03 Presence of the Environment** in terms of knowing that the environment exists for beneficiaries “People who care (Existence)”
      - **03.02.02.02 Bequest** is represented by FECS-CS category **03 Presence of the Environment** in terms of knowing that the environment exists for beneficiaries “People who care (Option/Bequest)”
- 04 Abiotic provisioning
  - 04.03 Energy
    - **04.03.01 Renewable abiotic energy sources** is represented by FECS-CS category **20 Wind** in terms of suitable wind speeds for power generation.

## 6 Inconsistencies and exclusions

Both classification systems incorporate minor inconsistencies that could be remedied on subsequent revisions.

Both include “water” as an ecosystem service. There is no doubt that ecosystems play a role in retaining and purifying water, however, “water” itself may be better viewed as an abiotic element.

FEGS-CS, for example:

1. Considers **12 Pollinators** and **13 Depredation and (pest) predators** as providing a service only to farmers, whereas others, such as Livestock Grazers, Foresters and others could also directly benefit.
2. Considers **10 Fish** only in terms of providing a service to Anglers. Presumably, they are included with **04 Fauna** for other beneficiaries (such as Food Subsisters, Food Pickers and Gatherers and Food Extractors)
3. **17 Land** is represented only as a medium for transportation, whereas **07 Open Space** represents suitable conditions for agricultural and military activities. **03 Presence of the Environment** also includes elements of land as a substrate for activities.
4. Includes **12 Pollinators**, but not seed dispersers.
5. Views **14 Timber** as a service to Timber, Fiber, and Fur/Hide Subsisters, but not to Foresters.
6. Views **01 Water** as a service to Boaters, but not Waders, Swimmers, and Divers (**03 Presence of the environment** is a service to both Beneficiary Sub-categories)
7. Classifies some Beneficiary Sub-categories in more than one Beneficiary Category. For example **0503 Timber, Fiber, and Fur/Hide Subsisters** occur both in Commercial/Industrial and Subsistence depending on whether the FEGS is for own or commercial use. To maintain the hierarchy, they should be in one category or the other. This also occurs for **0303 Residential Property Owners**.

CICES, for example:

1. Refers to “Nutrition” as a Division of ecosystem services, however, nutrition may be better viewed as the benefit derived from the service of biomass. Perhaps this could be renamed “nutritional biomass”.
2. Several classes are broad in scope and could imply multiple service types, uses or beneficiaries. These might be better subdivided to differentiate, for example, plants from animals and ecosystem types that are providing the services using different ecosystem processes:
  - 01 Provisioning
    - 01.02 Materials
      - 01.02.01 Biomass
        - **01.02.01.01 Fibres and other materials from plants, algae and animals for direct use or processing**
        - **01.02.01.02 Materials from plants, algae and animals for agricultural use**
  - 02 Regulation and maintenance
    - 02.01 Mediation of waste, toxics and other nuisances
      - 02.01.01 Mediation by biota
        - **02.01.01.01 Bio-remediation by micro-organisms, algae, plants, and animals**
        - **02.01.01.02 Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and animals**
      - 02.01.02 Mediation by ecosystems
        - **02.01.02.01 Filtration/sequestration/storage/accumulation by ecosystems**
        - **02.01.02.02 Dilution by atmosphere, freshwater and marine ecosystems**
        - **02.01.02.03 Mediation of smell/noise/visual impacts**
    - 02.02 Mediation of flows
      - 02.02.01 Mass flows
        - **02.02.01.01 Mass stabilisation and control of erosion rates**
        - **02.02.01.02 Buffering and attenuation of mass flows**
      - 02.02.02 Liquid flows
        - **02.02.02.01 Hydrological cycle and water flow maintenance**
        - **02.02.02.02 Flood protection**

- 02.02.03 Gaseous/air flows
        - **02.02.03.01 Storm protection**
        - **02.02.03.02 Ventilation and transpiration**
    - 02.03 Maintenance of physical, chemical and biological conditions
      - 02.03.01 Lifecycle maintenance, habitat and gene pool protection
        - **02.03.01.01 Pollination and seed dispersal**
        - **02.03.01.02 Maintaining nursery populations and habitats**
      - 02.03.05 Atmospheric composition and climate regulation
        - **02.03.05.01 Global climate regulation by reduction of greenhouse gas concentrations**
        - **02.03.05.02 Micro and regional climate regulation**
3. Two classes relate to the conditions achieved through services linked to living systems. These could be extended to cover other ecosystem components such as soil, sediments, marine waters, etc.:
- 02 Regulation and maintenance
    - 02.03 Maintenance of physical, chemical and biological conditions
      - 02.03.04 Water conditions
        - **02.03.04.01 Chemical condition of freshwaters**
        - **02.03.04.02 Chemical condition of salt waters**

## 7 Insights from a survey on ecosystem accounting

In mid-2015, Bordt (2016) conducted a survey to obtain the insights of the broader community of practice of ecosystem accounting. The 131 respondents represented a spectrum of researchers, analysts, statisticians and users. Their experience ranged from short courses in ecosystem accounting to practitioners and national experts contributing to the development of ecosystem accounting and related activities (e.g., modelling, mapping of ecosystem services).

The survey was designed to pinpoint areas of consensus and dissensus on 52 statements, some of which were related to classification of ecosystem services. The results for these statements are presented below in terms of the overall consensus/dissensus:

- *Biodiversity should be considered a final ecosystem service:* Responses to this statement showed **very high dissensus**. This suggests that an ecosystem services classification should at least explain how biodiversity is defined and, if it is excluded from the classification system, the rationale should be given.
- *"Cultural services" are too vague to be included in an Ecosystem Accounting framework:* Responses showed **consensus to disagree**. That is, cultural services were not considered "too vague" and their measurement should be further systematized.
- *Ecosystem Accounting should measure ecosystem processes that contribute to Ecosystem Services.* Responses showed **consensus to agree**. This emphasizes the need to link ecosystem services classification to the processes that underpin them.
- *To link ecosystem condition to Ecosystem Services, a production function for each Ecosystem Service is needed:* Responses showed **consensus to agree**. This also suggests the need to link ecosystem services classifications with ecological processes.
- *There is too much uncertainty in linking Ecosystem Services to human well-being for Ecosystem Accounting to be useful:* Responses showed **high dissensus**, highlighting the need for a better understanding of the direct linkages between ecosystem services and well-being.
- *The Common International Classification of Ecosystem Service (CICES) is a useful, comprehensive and coherent checklist of Ecosystem Services.* Responses showed **consensus to be neutral**. That is, many respondents neither agreed nor disagreed. A similar statement was not asked regarding FECS-CS. However, the neutrality of the responses to this statements suggests that the community of practice believes more work is required.

The analysis of the full 52 statements focuses on identifying discourses (sub-communities) within the community of practice. Identifying these discourses and their viewpoints will foster further constructive dialogue towards the future development of ecosystem accounting.

## 8 Suggestions for building upon FECS-CS and CICES for an international standard classification

Both FECS-CS and CICES will make valuable contributions to an internationally-applicable and statistically robust standard classification system of the contributions of nature to human well-being. FECS-CS provides a very comprehensive view of “final” ecosystem services linked to direct enjoyment, consumption and use by specific beneficiaries. CICES is more inclusive of the kinds of ecosystem services that have been measured in the past, including services that support the future production of “final” ecosystem services and are less directly connected to ecosystem processes.

A rigorous statistical classification requires a detailed definition of what is to be classified and the purpose of the classification. The principle of “outside-in” suggests an initial scope of considering *all contributions of nature (positive and negative<sup>11</sup>) to long-term human well-being*. This would be inclusive of the current definition of “final” ecosystem services, while acknowledging the need to accommodate different levels of “directness” and “linkage to ecological processes”. Such a definition would recognize that there are different “kinds” of services that people “enjoy” and that some services may not be recognized by the beneficiary, but will still impact their short and long-term well-being. Such a definition would also be inclusive of ethical and cultural perspectives that view nature not only as an instrument for human use, but as *“a holistic entity that sustains all living things, and of which humans are an inextricable part, physically and spiritually”* (Díaz et al., 2015).

A classification system based on such a definition could serve as the core of a framework of separate, but conceptually linked, classifications of all components of the Ecosystem Services Cascade (ecosystem types and conditions, ecosystems processes, ecosystem services, benefits, beneficiaries and human well-being). Keeping these classifications separate would avoid lumping concepts together and would facilitate modular revisions. Considering them all within one coherent framework would ensure their interoperability.

The rationale for maintaining such a broad initial scope is that:

- **Humans directly enjoy, consume and use many aspects of ecosystems and biodiversity:** This recognizes that the environment provides not only instrumental value (food, shelter, energy), but also affects the physical (clean air, water and liveable places) and psychological and social aspects (transformational, existence and relational value) of our well-being.
- **Ecosystem processes contribute to the production of ecosystem services, but may not be directly enjoyed, consumed, or used:** This recognizes that there is a set of conditions and chain of events that lead to the production of “final” ecosystem services. It is important to understand this and consider how to link these processes to ecosystem services and human well-being. Taking a long time-frame perspective suggests that processes and conditions that contribute to ecosystem integrity also be considered. For example, including ecosystems as beneficiaries would emphasize the critical need to maintain their capacity to provide future ecosystem services.
- **Some ecosystem services are “final” in some contexts, but not in others:** This suggests that the classification should recognize the multiple “purposes” of ecosystem services. However, these multiple purposes need not be embedded in the classification itself. Existing multi-purpose statistical classifications such as the Central Product Classification (CPC) (United Nations Statistics Division, 2015) includes both intermediate and final goods and services. Products are linked to expenditure categories for different purposes by sector (government, households, non-

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<sup>11</sup> The concept of “disservices” is included here for conceptual completeness. In practice, it is problematic to integrate “negative exchange values” in an accounting framework. Economic accounts, for example, measure production, whether or not the product has a positive or negative impact on the purchaser’s welfare. This can be seen as a distinction between market transactions and the welfare benefits of those transactions.

profit institutions, producers). Similarly, an ecosystem services classification could focus on the outputs of nature and link to separate classifications of beneficiaries and uses.

- **This would help align the nomenclature and concepts across the Ecosystem Services Cascade.** Terms such as “intermediate services”, “ecosystem functions” and “ecosystem services” are still interpreted differently in common usage. A broad approach would also support the categorization of related concepts (such as biodiversity, resilience, nutrient cycling, land as a substrate, photosynthesis, cultural diversity, social relations, etc.). If they are not services, then this broader framework would put them into context.

This is not to say that all components of the classification framework need to be regularly measured. Once the functional relationships are defined and classified, some subsets could be more regularly monitored than others, depending on the national, ecological and cultural context.

The primary purpose of such a classification framework should be to identify what to measure and how to aggregate those measures to be meaningful to support decisions affecting the contributions of nature to current and future human well-being. Using only monetary aggregates risks (a) ignoring many cultural benefits, (b) focussing on short-term production to the detriment of long-term integrity and therefore (c) resulting in misleading guidance. Such a classification framework could also identify knowledge gaps, provide an infrastructure to compile current knowledge and focus measurement priorities on ecosystems, processes and ecosystem services that require more regular monitoring.

The high-level structure of an ecosystem services classification (Bordt, 2016) could distinguishing ecological processes, services and conditions that are:

- (a) **Directly enjoyed, consumed or used and strongly linked to ecological processes:** those that contribute directly to economic and household production functions (e.g., the water and fauna consumed by livestock, wild foods and materials, some cultural services for which exchange values can be established). These are largely the intersection of FECS-CS and CICES.
- (b) **Directly enjoyed, consumed or used, but weakly linked to ecological processes:** those that been removed from ecosystem processes, either by harvesting or by other means. These correspond with many of the CICES “Provisioning Services”.
- (c) **Not directly enjoyed, consumed or used and strongly linked to ecological processes:** those that contribute to ecological production functions (e.g., biodiversity, primary productivity). These correspond with many of the CICES “Regulation and Maintenance” services.
- (d) **Not directly enjoyed, consumed or used, but not directly linked to ecological processes:** those that contribute to social production functions (e.g., existence, transformational, relational values).

The next level could be a classification of the production functions themselves. FECS-CS accomplishes this for economic and household production by linking ecosystem services to beneficiaries according to industrial sector (plus “All humans” and “People who care”) and environmental classes. CICES provides additional insights into ecological and social production in “Regulating and Maintenance” and “Cultural Services”.

To develop such a systematic classification of all components of the Ecosystem Services Cascade would be a massive undertaking if it were not for the substantial conceptual and empirical work already undertaken:

- FECS-CS and CICES provide excellent starting points;
- The NESCS (United States Environmental Protection Agency, 2015) links supply and demand of final ecosystem services and provides a useful conceptual framework to measure and catalogue the flows of “final” ecosystem services to economic and household uses and users;
- Work is progressing in the international community on a standard classification of land cover and ecosystems within an ecosystem accounting framework (Bordt, 2015);

- Kandziora *et al.* (2012) provide some theoretical and context-specific linkages between ecosystem properties, ecosystem services and well-being; and
- Progress is evident in understanding the dynamics of ecosystem services generation in (a) specific ecosystem types such as forests (Saarikoski *et al.*, 2015), wetlands (de Groot, Stuip, Finlayson, & Davidson, 2006; Nahlik, Landers, Ringold, & Weber, 2012) and marine (Edward B. Barbier *et al.*, 2011; Rocha, Yletyinen, Biggs, Blenckner, & Peterson, 2015), (b) one service type, such as pollination (Lautenbach, Seppelt, Liebscher, & Dormann, 2012) and (c) cultural services (Chan *et al.*, 2012). as well as ecological production functions for specific ecosystems (E. B. Barbier *et al.*, 2008).

What is missing is a comprehensive statistical classification of human well-being that includes the contribution of ecosystems:

- The OECD's (2011) *How's Life* program recognizes the importance of nature as an input to human well-being, but does not classify or measure it;
- Chan *et al.* (2012, 2016) broaden the scope of "cultural" services including relational values.

Any future international standard classification of ecosystem services would benefit from backward compatibility with both FECS-CS and CICES. In this way, past and current studies could be mapped to either using a process similar to that used in this concordance.

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**10 Annex 1 Detailed concordance between FECS-CS and CICES V4.3 (ordered by FECS-CS environmental sub-class, beneficiary subcategory and FECS)**

Environmental sub-class	Beneficiary Subcategory	FECS	Importance	CICES Code	CICES description	Notes
11 Rivers and Streams	0101 Irrigators	01 Water	water for growing and maintaining crops	01.02.02.01	Surface water for non-drinking purposes	
11 Rivers and Streams	0102 CAFO Operators	01 Water	water for livestock consumption	01.02.02.01	Surface water for non-drinking purposes	
11 Rivers and Streams	0103 Livestock Grazers	01 Water	water suitable for livestock consumption	01.02.02.01	Surface water for non-drinking purposes	
11 Rivers and Streams	0103 Livestock Grazers	02 Flora	non-cultivated vegetation for livestock consumption	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
11 Rivers and Streams	0104 Agricultural Processors	01 Water	water for processing edible products	01.02.02.01	Surface water for non-drinking purposes	
11 Rivers and Streams	0105 Aquaculturists	01 Water	conditions (i.e., water quality) provided by the environment for cultivating aquatic organisms	02.03.04.01	Chemical condition of freshwaters	
11 Rivers and Streams	0105 Aquaculturists	03 Presence of the environment	opportunity provided by the environment for cultivating aquatic organisms	NA	NA	A
11 Rivers and Streams	0201 Food Extractors	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) for commercial use or sale	01.01.01.03	Wild plants, algae and their outputs	
11 Rivers and Streams	0201 Food Extractors	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) for commercial use or sale	01.01.01.04	Wild animals and their outputs	
11 Rivers and Streams	0203 Industrial Processors	01 Water	water suitable for cooling or processing industrial products	01.02.02.01	Surface water for non-drinking purposes	
11 Rivers and Streams	0204 Industrial Dischargers	01 Water	medium for receiving industrial discharge	NA	NA	A
11 Rivers and Streams	0204 Industrial Dischargers	03 Presence of the environment	opportunity to discharge into the environment	NA	NA	A
11 Rivers and Streams	0205 Electric and other Energy Generators	01 Water	flowing water that can be used for energy generation	01.02.02.01	Surface water for non-drinking purposes	
11 Rivers and Streams	0205 Electric and other Energy Generators	03 Presence of the environment	opportunity to install power generation structures, such as dams and water turbines	NA	NA	A
11 Rivers and Streams	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of flooding, erosion, and pest infestation on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B

<b>Environmental sub-class</b>	<b>Beneficiary Subcategory</b>	<b>FEGS</b>	<b>Importance</b>	<b>CICES Code</b>	<b>CICES description</b>	<b>Notes</b>
11 Rivers and Streams	0207 Pharmaceutical and Food Supplement Suppliers	02 Flora	organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
11 Rivers and Streams	0207 Pharmaceutical and Food Supplement Suppliers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) or products associated with organisms (i.e., oils, fats, keratin, etc.) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
11 Rivers and Streams	0208 Fur/Hide Trappers and Hunters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides for commercial use or sale	01.01.01.04	Wild animals and their outputs	
11 Rivers and Streams	0301 Municipal Drinking Water Plant Operators	01 Water	water suitable for processing by a municipal drinking water plant	01.01.02.01	Surface water for drinking	
11 Rivers and Streams	0302 Waste Water Treatment Plant Operators	01 Water	medium for discharging [treated municipal wastewater] into the environment	NA	NA	A
11 Rivers and Streams	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of flooding, erosion, and pest infestation on the property	03.01.02.05	Aesthetic	D
11 Rivers and Streams	0304 Military/Coast Guard	03 Presence of the environment	opportunity for placement of infrastructure	NA	NA	A
11 Rivers and Streams	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
11 Rivers and Streams	0401 Transporters of Goods	01 Water	medium for and conditions that support the transportation of goods	01.02.02.01	Surface water for non-drinking purposes	
11 Rivers and Streams	0401 Transporters of Goods	03 Presence of the environment	opportunity for the transportation of goods	NA	NA	A
11 Rivers and Streams	0402 Transporters of People	01 Water	medium for and conditions that support the transportation of people	01.02.02.01	Surface water for non-drinking purposes	
11 Rivers and Streams	0402 Transporters of People	03 Presence of the environment	opportunity for the transportation of people	NA	NA	A
11 Rivers and Streams	0501 Water Subsisters	01 Water	water suitable for drinking (i.e., human consumption)	01.01.02.01	Surface water for drinking	
11 Rivers and Streams	0502 Food Subsisters	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
11 Rivers and Streams	0502 Food Subsisters	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) that are hunted for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
11 Rivers and Streams	0503 Timber, Fiber, and Fur/Hide Subsisters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
11 Rivers and Streams	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	fiber used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
11 Rivers and Streams	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	non-cultivated fiber for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
11 Rivers and Streams	0503 Timber, Fiber, and Fur/Hide Subsisters	06 Natural materials	non-cultivated ornamental products or by-products (from cultivation) used ornamentally for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
11 Rivers and Streams	0601 Experiencers and Viewers	02 Flora	organisms (i.e., flowers, plants, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
11 Rivers and Streams	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.02.05	Aesthetic	D
11 Rivers and Streams	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
11 Rivers and Streams	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
11 Rivers and Streams	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
11 Rivers and Streams	0602 Food Pickers and Gatherers	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are picked and/or gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
11 Rivers and Streams	0602 Food Pickers and Gatherers	04 Fauna	edible organisms (i.e., insects, some aquatic organisms, etc.) that are picked and/or gathered (i.e., not hunted or fished) for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
11 Rivers and Streams	0603 Hunters	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be hunted	01.01.01.04	Wild animals and their outputs	
11 Rivers and Streams	0604 Anglers	10 Fish	fish in the water	01.01.01.04	Wild animals and their outputs	
11 Rivers and Streams	0605 Waders, Swimmers, and Divers	03 Presence of the environment	opportunity and conditions for wading, swimming, and/or diving	03.01.01.02	Physical use of land-/seascapes in different environmental settings	

<b>Environmental sub-class</b>	<b>Beneficiary Subcategory</b>	<b>FEGS</b>	<b>Importance</b>	<b>CICES Code</b>	<b>CICES description</b>	<b>Notes</b>
11 Rivers and Streams	0606 Boaters	01 Water	medium and conditions for recreational boating	01.02.02.01, 02.03.04.01	Surface water for non-drinking purposes	B
11 Rivers and Streams	0606 Boaters	03 Presence of the environment	opportunity for recreational boating	03.01.01.02, 02.03.04.01	Physical use of land-/seascapes in different environmental settings	B
11 Rivers and Streams	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
11 Rivers and Streams	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
11 Rivers and Streams	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
11 Rivers and Streams	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
11 Rivers and Streams	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
11 Rivers and Streams	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
11 Rivers and Streams	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
11 Rivers and Streams	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
11 Rivers and Streams	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
12 Wetlands	0101 Irrigators	01 Water	water for growing and maintaining crops	01.02.02.01	Surface water for non-drinking purposes	
12 Wetlands	0103 Livestock Grazers	01 Water	water suitable for livestock consumption	01.02.02.01	Surface water for non-drinking purposes	
12 Wetlands	0103 Livestock Grazers	02 Flora	non-cultivated vegetation for livestock consumption	01.02.01.02	Materials from plants, algae and animals for agricultural use	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
12 Wetlands	0103 Livestock Grazers	07 Open space	suitable conditions (i.e., land) to graze livestock	NA	NA	A
12 Wetlands	0105 Aquaculturists	01 Water	medium and conditions (i.e., water quality) provided by the environment for cultivating aquatic organisms	02.03.04.01	Chemical condition of freshwaters	
12 Wetlands	0105 Aquaculturists	03 Presence of the environment	opportunity provided by the environment for cultivating aquatic organisms	NA	NA	A
12 Wetlands	0106 Farmers	07 Open space	suitable conditions (i.e., land) in which to grow annual or perennial crops (NOT crops themselves)	NA	NA	A
12 Wetlands	0106 Farmers	11 Soil	suitable soil in which annual or perennial crops (NOT crops themselves) can be grown	NA	NA	A
12 Wetlands	0106 Farmers	12 Pollinators	wild pollinators that provide opportunity to grow annual or perennial crops	02.03.01.01	Pollination and seed dispersal	F
12 Wetlands	0106 Farmers	13 Depredators and (pest) predators	wild depredators and (pest) predators that provide opportunity to grow crops	02.03.02.01	Pest control	
12 Wetlands	0201 Food Extractors	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) for commercial use or sale	01.01.01.03	Wild plants, algae and their outputs	
12 Wetlands	0201 Food Extractors	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) for commercial use or sale	01.01.01.04	Wild animals and their outputs	
12 Wetlands	0204 Industrial Dischargers	01 Water	medium for receiving industrial discharge	NA	NA	A
12 Wetlands	0204 Industrial Dischargers	03 Presence of the environment	opportunity to discharge into the environment	NA	NA	A
12 Wetlands	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of flooding, erosion, and pest infestation on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B
12 Wetlands	0207 Pharmaceutical and Food Supplement Suppliers	02 Flora	organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
12 Wetlands	0207 Pharmaceutical and Food Supplement Suppliers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) or products associated with organisms (i.e., oils, fats, keratin, etc.) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
12 Wetlands	0208 Fur/Hide Trappers and Hunters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides for commercial use or sale	01.01.01.04	Wild animals and their outputs	
12 Wetlands	0302 Waste Water Treatment Plant Operators	01 Water	medium for discharging [treated municipal wastewater] into the environment	NA	NA	A
12 Wetlands	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of flooding, erosion, and pest infestation on the property	03.01.02.05	Aesthetic	D
12 Wetlands	0304 Military/Coast Guard	03 Presence of the environment	opportunity for placement of infrastructure	NA	NA	A
12 Wetlands	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
12 Wetlands	0502 Food Subsisters	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
12 Wetlands	0502 Food Subsisters	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) that are hunted for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
12 Wetlands	0503 Timber, Fiber, and Fur/Hide Subsisters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
12 Wetlands	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	fiber used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
12 Wetlands	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	non-cultivated fiber for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
12 Wetlands	0503 Timber, Fiber, and Fur/Hide Subsisters	06 Natural materials	non-cultivated ornamental products or by-products (from cultivation) used ornamentally for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
12 Wetlands	0503 Timber, Fiber, and Fur/Hide Subsisters	14 Timber	timber (i.e., trees) used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
12 Wetlands	0503 Timber, Fiber, and Fur/Hide Subsisters	14 Timber	non-cultivated timber (i.e., trees) for commercial use or sale	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
12 Wetlands	0601 Experiencers and Viewers	02 Flora	organisms (i.e., flowers, plants, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
12 Wetlands	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
12 Wetlands	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
12 Wetlands	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
12 Wetlands	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
12 Wetlands	0602 Food Pickers and Gatherers	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are picked and/or gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
12 Wetlands	0602 Food Pickers and Gatherers	04 Fauna	edible organisms (i.e., insects, some aquatic organisms, etc.) that are picked and/or gathered (i.e., not hunted or fished) for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
12 Wetlands	0603 Hunters	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be hunted	01.01.01.04	Wild animals and their outputs	
12 Wetlands	0604 Anglers	10 Fish	fish in the water	01.01.01.04	Wild animals and their outputs	
12 Wetlands	0605 Waders, Swimmers, and Divers	03 Presence of the environment	opportunity and conditions for wading, swimming, and/or diving	03.01.01.02, 02.03.04.01	Physical use of land-/seascapes in different environmental settings	B
12 Wetlands	0606 Boaters	01 Water	medium and conditions for recreational boating	01.02.02.01, 02.03.04.01	Surface water for non-drinking purposes	B
12 Wetlands	0606 Boaters	03 Presence of the environment	opportunity for recreational boating	03.01.01.02, 02.03.04.01	Physical use of land-/seascapes in different environmental settings	B
12 Wetlands	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
12 Wetlands	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
12 Wetlands	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
12 Wetlands	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
12 Wetlands	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
12 Wetlands	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
12 Wetlands	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
12 Wetlands	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
12 Wetlands	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
13 Lakes and Ponds	0101 Irrigators	01 Water	water for growing and maintaining crops	01.02.02.01	Surface water for non-drinking purposes	
13 Lakes and Ponds	0102 CAFO Operators	01 Water	water for livestock consumption	01.02.02.01	Surface water for non-drinking purposes	
13 Lakes and Ponds	0103 Livestock Grazers	01 Water	water suitable for livestock consumption	01.02.02.01	Surface water for non-drinking purposes	
13 Lakes and Ponds	0104 Agricultural Processors	01 Water	water for processing edible products	01.02.02.01	Surface water for non-drinking purposes	
13 Lakes and Ponds	0105 Aquaculturists	01 Water	medium and conditions (i.e., water quality) provided by the environment for cultivating aquatic organisms	02.03.04.01	Chemical condition of freshwaters	
13 Lakes and Ponds	0105 Aquaculturists	03 Presence of the environment	opportunity provided by the environment for cultivating aquatic organisms	NA	NA	A
13 Lakes and Ponds	0201 Food Extractors	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) for commercial use or sale	01.01.01.03	Wild plants, algae and their outputs	
13 Lakes and Ponds	0201 Food Extractors	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) for commercial use or sale	01.01.01.04	Wild animals and their outputs	
13 Lakes and Ponds	0203 Industrial Processors	01 Water	water suitable for cooling or processing industrial products	01.02.02.01	Surface water for non-drinking purposes	

<b>Environmental sub-class</b>	<b>Beneficiary Subcategory</b>	<b>FEGS</b>	<b>Importance</b>	<b>CICES Code</b>	<b>CICES description</b>	<b>Notes</b>
13 Lakes and Ponds	0204 Industrial Dischargers	01 Water	medium for receiving industrial discharge	NA	NA	A
13 Lakes and Ponds	0204 Industrial Dischargers	03 Presence of the environment	opportunity to discharge into the environment	NA	NA	A
13 Lakes and Ponds	0205 Electric and other Energy Generators	01 Water	flowing water that can be used for energy generation	01.02.02.01	Surface water for non-drinking purposes	
13 Lakes and Ponds	0205 Electric and other Energy Generators	03 Presence of the environment	opportunity to install power generation structures, such as dams and water turbines	NA	NA	A
13 Lakes and Ponds	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of flooding, erosion, and pest infestation on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B
13 Lakes and Ponds	0207 Pharmaceutical and Food Supplement Suppliers	02 Flora	organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
13 Lakes and Ponds	0207 Pharmaceutical and Food Supplement Suppliers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) or products associated with organisms (i.e., oils, fats, keratin, etc.) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
13 Lakes and Ponds	0208 Fur/Hide Trappers and Hunters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides for commercial use or sale	01.01.01.04	Wild animals and their outputs	
13 Lakes and Ponds	0301 Municipal Drinking Water Plant Operators	01 Water	water suitable for processing by a municipal drinking water plant	01.01.02.01	Surface water for drinking	
13 Lakes and Ponds	0302 Waste Water Treatment Plant Operators	01 Water	medium for discharging [treated municipal wastewater] into the environment	NA	NA	A
13 Lakes and Ponds	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of flooding, erosion, and pest infestation on the property	03.01.02.05	Aesthetic	D
13 Lakes and Ponds	0304 Military/Coast Guard	03 Presence of the environment	opportunity for placement of infrastructure	NA	NA	A
13 Lakes and Ponds	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
13 Lakes and Ponds	0401 Transporters of Goods	01 Water	medium for and conditions that support the transportation of goods	01.02.02.01	Surface water for non-drinking purposes	
13 Lakes and Ponds	0401 Transporters of Goods	03 Presence of the environment	opportunity for the transportation of goods	NA	NA	A

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
13 Lakes and Ponds	0402 Transporters of People	01 Water	medium for and conditions that support the transportation of people	01.02.02.01	Surface water for non-drinking purposes	
13 Lakes and Ponds	0402 Transporters of People	03 Presence of the environment	opportunity for the transportation of people	NA	NA	A
13 Lakes and Ponds	0501 Water Subsisters	01 Water	water suitable for drinking (i.e., human consumption)	01.01.02.01	Surface water for drinking	
13 Lakes and Ponds	0502 Food Subsisters	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
13 Lakes and Ponds	0502 Food Subsisters	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) that are hunted for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
13 Lakes and Ponds	0503 Timber, Fiber, and Fur/Hide Subsisters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
13 Lakes and Ponds	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	fiber used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
13 Lakes and Ponds	0503 Timber, Fiber, and Fur/Hide Subsisters	06 Natural materials	non-cultivated ornamental products or by-products (from cultivation) used ornamentally for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
13 Lakes and Ponds	0601 Experiencers and Viewers	02 Flora	organisms (i.e., flowers, plants, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
13 Lakes and Ponds	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
13 Lakes and Ponds	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
13 Lakes and Ponds	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
13 Lakes and Ponds	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
13 Lakes and Ponds	0602 Food Pickers and Gatherers	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are picked and/or gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
13 Lakes and Ponds	0602 Food Pickers and Gatherers	04 Fauna	edible organisms (i.e., insects, some aquatic organisms, etc.) that are picked and/or gathered (i.e., not hunted or fished) for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
13 Lakes and Ponds	0603 Hunters	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be hunted	01.01.01.04	Wild animals and their outputs	
13 Lakes and Ponds	0604 Anglers	10 Fish	fish in the water	01.01.01.04	Wild animals and their outputs	
13 Lakes and Ponds	0605 Waders, Swimmers, and Divers	03 Presence of the environment	opportunity and conditions for wading, swimming, and/or diving	03.01.01.02, 02.03.04.01	Physical use of land-/seascapes in different environmental settings	B
13 Lakes and Ponds	0606 Boaters	01 Water	medium and conditions for recreational boating	01.02.02.01, 02.03.04.01	Surface water for non-drinking purposes	B
13 Lakes and Ponds	0606 Boaters	03 Presence of the environment	opportunity for recreational boating	03.01.01.02, 02.03.04.01	Physical use of land-/seascapes in different environmental settings	B
13 Lakes and Ponds	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
13 Lakes and Ponds	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
13 Lakes and Ponds	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
13 Lakes and Ponds	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
13 Lakes and Ponds	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
13 Lakes and Ponds	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
13 Lakes and Ponds	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
13 Lakes and Ponds	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
13 Lakes and Ponds	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
14 Estuaries and Near Coastal Marine	0103 Livestock Grazers	01 Water	water suitable for livestock consumption	01.02.02.01	Surface water for non-drinking purposes	
14 Estuaries and Near Coastal Marine	0103 Livestock Grazers	02 Flora	non-cultivated vegetation for livestock consumption	01.02.01.02	Materials from plants, algae and animals for agricultural use	
14 Estuaries and Near Coastal Marine	0103 Livestock Grazers	07 Open space	suitable conditions (i.e., land) to graze livestock	NA	NA	A
14 Estuaries and Near Coastal Marine	0104 Agricultural Processors	01 Water	water for processing edible products	NA	NA	A
14 Estuaries and Near Coastal Marine	0105 Aquaculturists	03 Presence of the environment	opportunity provided by the environment for cultivating aquatic organisms	NA	NA	A
14 Estuaries and Near Coastal Marine	0201 Food Extractors	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) for commercial use or sale	01.01.01.03	Wild plants, algae and their outputs	
14 Estuaries and Near Coastal Marine	0201 Food Extractors	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) for commercial use or sale	01.01.01.04	Wild animals and their outputs	
14 Estuaries and Near Coastal Marine	0203 Industrial Processors	01 Water	water suitable for cooling or processing industrial products	01.02.02.01	Surface water for non-drinking purposes	
14 Estuaries and Near Coastal Marine	0204 Industrial Dischargers	01 Water	medium for receiving industrial discharge	NA	NA	A
14 Estuaries and Near Coastal Marine	0204 Industrial Dischargers	03 Presence of the environment	opportunity to discharge into the environment	NA	NA	A
14 Estuaries and Near Coastal Marine	0205 Electric and other Energy Generators	01 Water	flowing water that can be used for energy generation	01.02.02.01	Surface water for non-drinking purposes	
14 Estuaries and Near Coastal Marine	0205 Electric and other Energy Generators	03 Presence of the environment	opportunity to install power generation structures, such as dams and water turbines	NA	NA	A
14 Estuaries and Near Coastal Marine	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of flooding, erosion, and pest infestation on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B
14 Estuaries and Near Coastal Marine	0207 Pharmaceutical and Food Supplement Suppliers	02 Flora	organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
14 Estuaries and Near Coastal Marine	0207 Pharmaceutical and Food Supplement Suppliers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) or products associated with organisms (i.e., oils, fats, keratin, etc.) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
14 Estuaries and Near Coastal Marine	0208 Fur/Hide Trappers and Hunters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides for commercial use or sale	01.01.01.04	Wild animals and their outputs	
14 Estuaries and Near Coastal Marine	0301 Municipal Drinking Water Plant Operators	01 Water	water suitable for processing (via desalination) by a municipal drinking water plant	01.01.02.01	Surface water for drinking	
14 Estuaries and Near Coastal Marine	0302 Waste Water Treatment Plant Operators	01 Water	medium for discharging [treated municipal wastewater] into the environment	NA	NA	A
14 Estuaries and Near Coastal Marine	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of flooding, erosion, and pest infestation on the property	03.01.02.05	Aesthetic	D
14 Estuaries and Near Coastal Marine	0304 Military/Coast Guard	03 Presence of the environment	opportunity for placement of infrastructure	NA	NA	A
14 Estuaries and Near Coastal Marine	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
14 Estuaries and Near Coastal Marine	0401 Transporters of Goods	01 Water	medium for and conditions that support the transportation of goods	01.02.02.01	Surface water for non-drinking purposes	
14 Estuaries and Near Coastal Marine	0401 Transporters of Goods	03 Presence of the environment	opportunity for the transportation of goods	NA	NA	A
14 Estuaries and Near Coastal Marine	0402 Transporters of People	01 Water	medium for and conditions that support the transportation of people	01.02.02.01	Surface water for non-drinking purposes	
14 Estuaries and Near Coastal Marine	0402 Transporters of People	03 Presence of the environment	opportunity for the transportation of people	NA	NA	A
14 Estuaries and Near Coastal Marine	0502 Food Subsisters	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
14 Estuaries and Near Coastal Marine	0502 Food Subsisters	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) that are hunted for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
14 Estuaries and Near Coastal Marine	0503 Timber, Fiber, and Fur/Hide Subsisters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
14 Estuaries and Near Coastal Marine	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	non-cultivated fiber for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
14 Estuaries and Near Coastal Marine	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	fiber used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
14 Estuaries and Near Coastal Marine	0503 Timber, Fiber, and Fur/Hide Subsisters	06 Natural materials	non-cultivated ornamental products or by-products (from cultivation) used ornamentally for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
14 Estuaries and Near Coastal Marine	0503 Timber, Fiber, and Fur/Hide Subsisters	14 Timber	timber (i.e., trees) used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
14 Estuaries and Near Coastal Marine	0601 Experiencers and Viewers	02 Flora	organisms (i.e., flowers, plants, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
14 Estuaries and Near Coastal Marine	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
14 Estuaries and Near Coastal Marine	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
14 Estuaries and Near Coastal Marine	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
14 Estuaries and Near Coastal Marine	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
14 Estuaries and Near Coastal Marine	0602 Food Pickers and Gatherers	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are picked and/or gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
14 Estuaries and Near Coastal Marine	0602 Food Pickers and Gatherers	04 Fauna	edible organisms (i.e., insects, some aquatic organisms, etc.) that are picked and/or gathered (i.e., not hunted or fished) for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
14 Estuaries and Near Coastal Marine	0603 Hunters	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be hunted	01.01.01.04	Wild animals and their outputs	
14 Estuaries and Near Coastal Marine	0604 Anglers	10 Fish	fish in the water	01.01.01.04	Wild animals and their outputs	

<b>Environmental sub-class</b>	<b>Beneficiary Subcategory</b>	<b>FEGS</b>	<b>Importance</b>	<b>CICES Code</b>	<b>CICES description</b>	<b>Notes</b>
14 Estuaries and Near Coastal Marine	0605 Waders, Swimmers, and Divers	03 Presence of the environment	opportunity and conditions for wading, swimming, and/or diving	03.01.01.02, 02.03.04.01	Physical use of land-/seascapes in different environmental settings	B
14 Estuaries and Near Coastal Marine	0606 Boaters	01 Water	medium and conditions for recreational boating	01.02.02.01, 02.03.04.01	Surface water for non-drinking purposes	B
14 Estuaries and Near Coastal Marine	0606 Boaters	03 Presence of the environment	opportunity for recreational boating	03.01.01.02, 02.03.04.01	Physical use of land-/seascapes in different environmental settings	
14 Estuaries and Near Coastal Marine	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
14 Estuaries and Near Coastal Marine	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
14 Estuaries and Near Coastal Marine	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
14 Estuaries and Near Coastal Marine	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
14 Estuaries and Near Coastal Marine	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
14 Estuaries and Near Coastal Marine	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
14 Estuaries and Near Coastal Marine	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
14 Estuaries and Near Coastal Marine	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
14 Estuaries and Near Coastal Marine	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
15 Open Oceans and Seas	0105 Aquaculturists	01 Water	medium and conditions (i.e., water quality) provided by the environment for cultivating aquatic organisms	NA	NA	A

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
15 Open Oceans and Seas	0105 Aquaculturists	03 Presence of the environment	opportunity provided by the environment for cultivating aquatic organisms	NA	NA	A
15 Open Oceans and Seas	0201 Food Extractors	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) for commercial use or sale	01.01.01.03	Wild plants, algae and their outputs	
15 Open Oceans and Seas	0201 Food Extractors	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) for commercial use or sale	01.01.01.04	Wild animals and their outputs	
15 Open Oceans and Seas	0203 Industrial Processors	01 Water	water suitable for cooling or processing industrial products (specifically oil rigs, in this case)	01.02.02.01	Surface water for non-drinking purposes	
15 Open Oceans and Seas	0204 Industrial Dischargers	01 Water	medium for receiving industrial discharge	NA	NA	A
15 Open Oceans and Seas	0204 Industrial Dischargers	03 Presence of the environment	opportunity to discharge into the environment (by oil rigs and cruise liners, in this case)	NA	NA	A
15 Open Oceans and Seas	0205 Electric and other Energy Generators	01 Water	flowing water (i.e., waves) that can be used for energy generation	01.02.02.01	Surface water for non-drinking purposes	
15 Open Oceans and Seas	0205 Electric and other Energy Generators	03 Presence of the environment	opportunity to install power generation structures	NA	NA	A
15 Open Oceans and Seas	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure (specifically, cruise liners)	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B
15 Open Oceans and Seas	0207 Pharmaceutical and Food Supplement Suppliers	02 Flora	organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
15 Open Oceans and Seas	0207 Pharmaceutical and Food Supplement Suppliers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) or products associated with organisms (i.e., oils, fats, keratin, etc.) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
15 Open Oceans and Seas	0304 Military/Coast Guard	03 Presence of the environment	opportunity for placement of infrastructure	NA	NA	A
15 Open Oceans and Seas	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
15 Open Oceans and Seas	0401 Transporters of Goods	01 Water	medium for and conditions that support the transportation of goods	01.02.02.01	Surface water for non-drinking purposes	
15 Open Oceans and Seas	0401 Transporters of Goods	03 Presence of the environment	opportunity for the transportation of goods	NA	NA	A

<b>Environmental sub-class</b>	<b>Beneficiary Subcategory</b>	<b>FEGS</b>	<b>Importance</b>	<b>CICES Code</b>	<b>CICES description</b>	<b>Notes</b>
15 Open Oceans and Seas	0402 Transporters of People	01 Water	medium for and conditions that support the transportation of people	01.02.02.01	Surface water for non-drinking purposes	
15 Open Oceans and Seas	0402 Transporters of People	03 Presence of the environment	opportunity for the transportation of people	NA	NA	A
15 Open Oceans and Seas	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
15 Open Oceans and Seas	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
15 Open Oceans and Seas	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
15 Open Oceans and Seas	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
15 Open Oceans and Seas	0603 Hunters	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be hunted	01.01.01.04	Wild animals and their outputs	
15 Open Oceans and Seas	0604 Anglers	10 Fish	fish in the water	01.01.01.04	Wild animals and their outputs	
15 Open Oceans and Seas	0605 Waders, Swimmers, and Divers	03 Presence of the environment	opportunity and conditions for wading, swimming, and/or diving	03.01.01.02, 02.03.04.01	Physical use of land-/seascapes in different environmental settings	B
15 Open Oceans and Seas	0606 Boaters	01 Water	medium and conditions for recreational boating	01.02.02.01, 02.03.04.01	Surface water for non-drinking purposes	B
15 Open Oceans and Seas	0606 Boaters	03 Presence of the environment	opportunity for recreational boating	03.01.01.02, 02.03.04.01	Physical use of land-/seascapes in different environmental settings	B
15 Open Oceans and Seas	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
15 Open Oceans and Seas	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
15 Open Oceans and Seas	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
15 Open Oceans and Seas	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
15 Open Oceans and Seas	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
15 Open Oceans and Seas	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
15 Open Oceans and Seas	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
15 Open Oceans and Seas	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
15 Open Oceans and Seas	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
16 Groundwater	0101 Irrigators	01 Water	water for growing and maintaining crops	01.02.02.02	Ground water for non-drinking purposes	
16 Groundwater	0102 CAFO Operators	01 Water	water for livestock consumption	01.02.02.02	Ground water for non-drinking purposes	
16 Groundwater	0103 Livestock Grazers	01 Water	water suitable for livestock consumption	01.02.02.02	Ground water for non-drinking purposes	
16 Groundwater	0104 Agricultural Processors	01 Water	water for processing edible products	01.02.02.02	Ground water for non-drinking purposes	
16 Groundwater	0105 Aquaculturists	01 Water	medium and conditions (i.e., water quality) provided by the environment for cultivating aquatic organisms	01.02.02.02	Ground water for non-drinking purposes	
16 Groundwater	0105 Aquaculturists	03 Presence of the environment	opportunity provided by the environment for cultivating aquatic organisms	NA	NA	A
16 Groundwater	0203 Industrial Processors	01 Water	water suitable for cooling or processing industrial products	01.02.02.02	Ground water for non-drinking purposes	
16 Groundwater	0204 Industrial Dischargers	01 Water	medium for receiving industrial discharge	NA	NA	A
16 Groundwater	0204 Industrial Dischargers	03 Presence of the environment	opportunity to discharge into the environment	NA	NA	A
16 Groundwater	0205 Electric and other Energy Generators	01 Water	water that can be used for (geothermal) energy generation	01.02.02.02	Ground water for non-drinking purposes	
16 Groundwater	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of subsidence and sinkholes on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
16 Groundwater	0207 Pharmaceutical and Food Supplement Suppliers	01 Water	water used in medicines or sold for medicinal purposes	01.02.02.02	Ground water for non-drinking purposes	
16 Groundwater	0301 Municipal Drinking Water Plant Operators	01 Water	water suitable for processing by a municipal drinking water plant	01.01.02.02	Ground water for drinking	
16 Groundwater	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of subsidence and sinkholes on the property	03.01.02.05	Aesthetic	D
16 Groundwater	0501 Water Subsisters	01 Water	water suitable for drinking (i.e., human consumption)	01.01.02.02	Ground water for drinking	
16 Groundwater	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it, and groundwater phenomena	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
16 Groundwater	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
16 Groundwater	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
16 Groundwater	0605 Waders, Swimmers, and Divers	03 Presence of the environment	opportunity and conditions for wading and swimming (particularly in hot or mineral springs), and/or diving (particularly in caves)	03.01.01.02, 02.03.04.01	Physical use of land-/seascapes in different environmental settings	B
16 Groundwater	0606 Boaters	01 Water	medium and conditions for recreational boating (i.e., in caves)	01.02.02.01, 02.03.04.01	Surface water for non-drinking purposes	B
16 Groundwater	0606 Boaters	03 Presence of the environment	opportunity for recreational boating (i.e., in caves)	03.01.01.02, 02.03.04.01	Physical use of land-/seascapes in different environmental settings	B
16 Groundwater	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
16 Groundwater	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
16 Groundwater	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
16 Groundwater	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
16 Groundwater	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
16 Groundwater	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
16 Groundwater	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
16 Groundwater	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
21 Forests	0107 Foresters	07 Open space	suitable conditions (i.e., land) in which trees grow and to cultivate trees	NA	NA	A
21 Forests	0107 Foresters	11 Soil	suitable soil in which trees can be cultivated (NOT cultivated trees themselves)	NA	NA	A
21 Forests	0201 Food Extractors	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) for commercial use or sale	01.01.01.03	Wild plants, algae and their outputs	
21 Forests	0201 Food Extractors	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) for commercial use or sale	01.01.01.04	Wild animals and their outputs	
21 Forests	0201 Food Extractors	15 Fungi	edible organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) for commercial use or sale	01.01.01.03	Wild plants, algae and their outputs	
21 Forests	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of erosion, fire, and pest infestation on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	A
21 Forests	0207 Pharmaceutical and Food Supplement Suppliers	02 Flora	organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
21 Forests	0207 Pharmaceutical and Food Supplement Suppliers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) or products associated with organisms (i.e., oils, fats, keratin, etc.) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
21 Forests	0207 Pharmaceutical and Food Supplement Suppliers	15 Fungi	organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
21 Forests	0208 Fur/Hide Trappers and Hunters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides for commercial use or sale	01.01.01.04	Wild animals and their outputs	
21 Forests	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of erosion, fire, and pest infestation on the property	03.01.02.05	Aesthetic	D
21 Forests	0304 Military/Coast Guard	03 Presence of the environment	opportunity for placement of infrastructure	NA	NA	A
21 Forests	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
21 Forests	0502 Food Subsisters	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
21 Forests	0502 Food Subsisters	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) that are hunted for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
21 Forests	0502 Food Subsisters	15 Fungi	edible organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) that are hunted or gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
21 Forests	0503 Timber, Fiber, and Fur/Hide Subsisters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
21 Forests	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	non-cultivated fiber for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
21 Forests	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	fiber used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
21 Forests	0503 Timber, Fiber, and Fur/Hide Subsisters	06 Natural materials	non-cultivated ornamental products or by-products (from cultivation) used ornamentally for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
21 Forests	0503 Timber, Fiber, and Fur/Hide Subsisters	14 Timber	timber (i.e., trees) used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
21 Forests	0503 Timber, Fiber, and Fur/Hide Subsisters	14 Timber	non-cultivated timber (i.e., trees) for commercial use or sale	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
21 Forests	0601 Experiencers and Viewers	02 Flora	organisms (i.e., flowers, plants, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
21 Forests	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
21 Forests	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
21 Forests	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
21 Forests	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
21 Forests	0601 Experiencers and Viewers	15 Fungi	organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
21 Forests	0602 Food Pickers and Gatherers	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are picked and/or gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
21 Forests	0602 Food Pickers and Gatherers	04 Fauna	edible organisms (i.e., insects, some aquatic organisms, etc.) that are picked and/or gathered (i.e., not hunted or fished) for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
21 Forests	0602 Food Pickers and Gatherers	15 Fungi	edible organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) that are gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
21 Forests	0603 Hunters	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be hunted	01.01.01.04	Wild animals and their outputs	
21 Forests	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
21 Forests	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
21 Forests	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
21 Forests	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
21 Forests	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
21 Forests	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
21 Forests	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
21 Forests	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
21 Forests	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
22 Agroecosystems	0103 Livestock Grazers	07 Open space	suitable conditions (i.e., land) to graze livestock	NA	NA	A
22 Agroecosystems	0103 Livestock Grazers	11 Soil	suitable soil in which fields of feed (i.e., on which livestock will directly graze) can be grown (NOT feed itself)	NA	NA	A
22 Agroecosystems	0106 Farmers	07 Open space	suitable conditions (i.e., land) in which to grow annual or perennial crops (NOT crops themselves)	NA	NA	A
22 Agroecosystems	0106 Farmers	11 Soil	suitable soil in which annual or perennial crops (NOT crops themselves) can be grown	NA	NA	A
22 Agroecosystems	0106 Farmers	12 Pollinators	wild pollinators that provide opportunity to grow annual or perennial crops	02.03.01.01	Pollination and seed dispersal	F
22 Agroecosystems	0106 Farmers	13 Depredators and (pest) predators	wild depredators and (pest) predators that provide opportunity to grow annual or perennial crops	02.03.02.01	Pest control	
22 Agroecosystems	0205 Electric and other Energy Generators	03 Presence of the environment	opportunity to install power generation structures	NA	NA	A

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
22 Agroecosystems	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of erosion, fire, and pest infestation on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B
22 Agroecosystems	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of erosion, fire, and pest infestation on the property	03.01.02.05	Aesthetic	D
22 Agroecosystems	0503 Timber, Fiber, and Fur/Hide Subsisters	06 Natural materials	non-cultivated ornamental products or by-products (from cultivation) used ornamentally for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
22 Agroecosystems	0601 Experiencers and Viewers	02 Flora	organisms (i.e., flowers, plants, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
22 Agroecosystems	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
22 Agroecosystems	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
22 Agroecosystems	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
22 Agroecosystems	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
22 Agroecosystems	0601 Experiencers and Viewers	15 Fungi	organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
22 Agroecosystems	0603 Hunters	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be hunted	01.01.01.04	Wild animals and their outputs	
22 Agroecosystems	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
22 Agroecosystems	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
22 Agroecosystems	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
22 Agroecosystems	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
22 Agroecosystems	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
22 Agroecosystems	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
22 Agroecosystems	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
22 Agroecosystems	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
22 Agroecosystems	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
23 Created Greenspace	0205 Electric and other Energy Generators	03 Presence of the environment	opportunity to install power generation structures	NA	NA	A
23 Created Greenspace	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of pest infestation on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B
23 Created Greenspace	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of pest infestation on the property	03.01.02.05	Aesthetic	D
23 Created Greenspace	0304 Military/Coast Guard	03 Presence of the environment	opportunity for placement of infrastructure	NA	NA	A
23 Created Greenspace	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
23 Created Greenspace	0502 Food Subsisters	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
23 Created Greenspace	0502 Food Subsisters	15 Fungi	edible organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) that are hunted or gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
23 Created Greenspace	0601 Experiencers and Viewers	02 Flora	organisms (i.e., flowers, plants, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
23 Created Greenspace	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	

<b>Environmental sub-class</b>	<b>Beneficiary Subcategory</b>	<b>FEGS</b>	<b>Importance</b>	<b>CICES Code</b>	<b>CICES description</b>	<b>Notes</b>
23 Created Greenspace	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
23 Created Greenspace	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
23 Created Greenspace	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
23 Created Greenspace	0601 Experiencers and Viewers	15 Fungi	organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
23 Created Greenspace	0602 Food Pickers and Gatherers	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are picked and/or gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
23 Created Greenspace	0602 Food Pickers and Gatherers	15 Fungi	edible organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) that are gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
23 Created Greenspace	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
23 Created Greenspace	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
23 Created Greenspace	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
23 Created Greenspace	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
23 Created Greenspace	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
23 Created Greenspace	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
23 Created Greenspace	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
23 Created Greenspace	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
23 Created Greenspace	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
24 Grasslands	0103 Livestock Grazers	02 Flora	non-cultivated vegetation for livestock consumption	01.02.01.02	Materials from plants, algae and animals for agricultural use	
24 Grasslands	0103 Livestock Grazers	07 Open space	suitable conditions (i.e., land) to graze livestock	NA	NA	A
24 Grasslands	0106 Farmers	07 Open space	suitable conditions (i.e., land) in which to grow annual or perennial crops (NOT crops themselves)	NA	NA	A
24 Grasslands	0106 Farmers	11 Soil	suitable soil in which annual or perennial crops (NOT crops themselves) can be grown	NA	NA	A
24 Grasslands	0106 Farmers	12 Pollinators	wild pollinators that provide opportunity to grow annual or perennial crops	02.03.01.01	Pollination and seed dispersal	F
24 Grasslands	0106 Farmers	13 Depredators and (pest) predators	wild depredators and (pest) predators that provide opportunity to grow crops	02.03.02.01	Pest control	
24 Grasslands	0201 Food Extractors	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) for commercial use or sale	01.01.01.03	Wild plants, algae and their outputs	
24 Grasslands	0201 Food Extractors	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) for commercial use or sale	01.01.01.04	Wild animals and their outputs	
24 Grasslands	0201 Food Extractors	15 Fungi	edible organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) for commercial use or sale	01.01.01.03	Wild plants, algae and their outputs	
24 Grasslands	0205 Electric and other Energy Generators	03 Presence of the environment	opportunity to install power generation structures	NA	NA	A
24 Grasslands	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of fire and pest infestation on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
24 Grasslands	0207 Pharmaceutical and Food Supplement Suppliers	02 Flora	organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
24 Grasslands	0207 Pharmaceutical and Food Supplement Suppliers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) or products associated with organisms (i.e., oils, fats, keratin, etc.) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
24 Grasslands	0207 Pharmaceutical and Food Supplement Suppliers	15 Fungi	organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
24 Grasslands	0208 Fur/Hide Trappers and Hunters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides for commercial use or sale	01.01.01.04	Wild animals and their outputs	
24 Grasslands	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of fire and pest infestation on the property	03.01.02.05	Aesthetic	D
24 Grasslands	0304 Military/Coast Guard	03 Presence of the environment	opportunity for placement of infrastructure	NA	NA	A
24 Grasslands	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
24 Grasslands	0502 Food Subsisters	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
24 Grasslands	0502 Food Subsisters	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) that are hunted for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
24 Grasslands	0502 Food Subsisters	15 Fungi	edible organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) that are hunted or gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
24 Grasslands	0503 Timber, Fiber, and Fur/Hide Subsisters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
24 Grasslands	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	non-cultivated fiber for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
24 Grasslands	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	fiber used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
24 Grasslands	0503 Timber, Fiber, and Fur/Hide Subsisters	06 Natural materials	non-cultivated ornamental products or by-products (from cultivation) used ornamentally for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
24 Grasslands	0503 Timber, Fiber, and Fur/Hide Subsisters	14 Timber	timber (i.e., trees) used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
24 Grasslands	0601 Experiencers and Viewers	02 Flora	organisms (i.e., flowers, plants, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
24 Grasslands	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
24 Grasslands	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
24 Grasslands	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
24 Grasslands	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
24 Grasslands	0601 Experiencers and Viewers	15 Fungi	organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
24 Grasslands	0602 Food Pickers and Gatherers	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are picked and/or gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
24 Grasslands	0602 Food Pickers and Gatherers	04 Fauna	edible organisms (i.e., insects, some aquatic organisms, etc.) that are picked and/or gathered (i.e., not hunted or fished) for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
24 Grasslands	0602 Food Pickers and Gatherers	15 Fungi	edible organisms (i.e., mushrooms, shelf fungus, puffballs, etc.) that are gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
24 Grasslands	0603 Hunters	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be hunted	01.01.01.04	Wild animals and their outputs	
24 Grasslands	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
24 Grasslands	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
24 Grasslands	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
24 Grasslands	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
24 Grasslands	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
24 Grasslands	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
24 Grasslands	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
24 Grasslands	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
24 Grasslands	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
25 Scrubland/Shrubland	0102 CAFO Operators	07 Open space	suitable conditions (i.e., land) to hold livestock and site the CAFO operation	NA	NA	A
25 Scrubland/Shrubland	0103 Livestock Grazers	02 Flora	non-cultivated vegetation for livestock consumption	01.02.01.02	Materials from plants, algae and animals for agricultural use	
25 Scrubland/Shrubland	0103 Livestock Grazers	07 Open space	suitable conditions (i.e., land) to graze livestock	NA	NA	A
25 Scrubland/Shrubland	0201 Food Extractors	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) for commercial use or sale	01.01.01.03	Wild plants, algae and their outputs	
25 Scrubland/Shrubland	0205 Electric and other Energy Generators	03 Presence of the environment	opportunity to install power generation structures	NA	NA	A

<b>Environmental sub-class</b>	<b>Beneficiary Subcategory</b>	<b>FEGS</b>	<b>Importance</b>	<b>CICES Code</b>	<b>CICES description</b>	<b>Notes</b>
25 Scrubland/Shrubland	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of fire and pest infestation on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B
25 Scrubland/Shrubland	0207 Pharmaceutical and Food Supplement Suppliers	02 Flora	organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
25 Scrubland/Shrubland	0208 Fur/Hide Trappers and Hunters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides for commercial use or sale	01.01.01.04	Wild animals and their outputs	
25 Scrubland/Shrubland	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of fire and pest infestation on the property	03.01.02.05	Aesthetic	D
25 Scrubland/Shrubland	0304 Military/Coast Guard	03 Presence of the environment	opportunity for placement of infrastructure	NA	NA	A
25 Scrubland/Shrubland	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
25 Scrubland/Shrubland	0401 Transporters of Goods	03 Presence of the environment	opportunity for the transportation of goods	NA	NA	A
25 Scrubland/Shrubland	0401 Transporters of Goods	17 Land	medium for and conditions that support the transportation of goods	NA	NA	A
25 Scrubland/Shrubland	0402 Transporters of People	03 Presence of the environment	opportunity for the transportation of people	NA	NA	A
25 Scrubland/Shrubland	0402 Transporters of People	17 Land	medium for and conditions that support the transportation of people	NA	NA	A
25 Scrubland/Shrubland	0502 Food Subsisters	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
25 Scrubland/Shrubland	0502 Food Subsisters	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) that are hunted for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
25 Scrubland/Shrubland	0503 Timber, Fiber, and Fur/Hide Subsisters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
25 Scrubland/Shrubland	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	non-cultivated fiber for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
25 Scrubland/Shrubland	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	fiber used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
25 Scrubland/Shrubland	0503 Timber, Fiber, and Fur/Hide Subsisters	06 Natural materials	non-cultivated ornamental products or by-products (from cultivation) used ornamentally for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
25 Scrubland/Shrubland	0503 Timber, Fiber, and Fur/Hide Subsisters	14 Timber	timber (i.e., trees) used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
25 Scrubland/Shrubland	0503 Timber, Fiber, and Fur/Hide Subsisters	14 Timber	non-cultivated timber (i.e., trees) for commercial use or sale	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
25 Scrubland/Shrubland	0601 Experiencers and Viewers	02 Flora	organisms (i.e., flowers, plants, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
25 Scrubland/Shrubland	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
25 Scrubland/Shrubland	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
25 Scrubland/Shrubland	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
25 Scrubland/Shrubland	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
25 Scrubland/Shrubland	0602 Food Pickers and Gatherers	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are picked and/or gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
25 Scrubland/Shrubland	0602 Food Pickers and Gatherers	04 Fauna	edible organisms (i.e., insects, some aquatic organisms, etc.) that are picked and/or gathered (i.e., not hunted or fished) for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
25 Scrubland/Shrubland	0603 Hunters	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be hunted	01.01.01.04	Wild animals and their outputs	
25 Scrubland/Shrubland	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
25 Scrubland/Shrubland	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
25 Scrubland/Shrubland	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
25 Scrubland/Shrubland	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
25 Scrubland/Shrubland	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
25 Scrubland/Shrubland	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
25 Scrubland/Shrubland	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
25 Scrubland/Shrubland	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
25 Scrubland/Shrubland	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
26 Barren/Rock and Sand	0102 CAFO Operators	07 Open space	suitable conditions (i.e., land) to hold livestock and site the CAFO operation	NA	NA	A
26 Barren/Rock and Sand	0205 Electric and other Energy Generators	03 Presence of the environment	opportunity to install power generation structures	NA	NA	A
26 Barren/Rock and Sand	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of erosion, fire, and pest infestation on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B
26 Barren/Rock and Sand	0207 Pharmaceutical and Food Supplement Suppliers	02 Flora	organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
26 Barren/Rock and Sand	0207 Pharmaceutical and Food Supplement Suppliers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) or products associated with organisms (i.e., oils, fats, keratin, etc.) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
26 Barren/Rock and Sand	0208 Fur/Hide Trappers and Hunters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides for commercial use or sale	01.01.01.04	Wild animals and their outputs	
26 Barren/Rock and Sand	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of erosion, fire, and pest infestation on the property	03.01.02.05	Aesthetic	D
26 Barren/Rock and Sand	0304 Military/Coast Guard	03 Presence of the environment	opportunity for placement of infrastructure	NA	NA	A
26 Barren/Rock and Sand	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
26 Barren/Rock and Sand	0401 Transporters of Goods	03 Presence of the environment	opportunity for the transportation of goods	NA	NA	A
26 Barren/Rock and Sand	0401 Transporters of Goods	17 Land	medium for and conditions that support the transportation of goods	NA	NA	A
26 Barren/Rock and Sand	0402 Transporters of People	03 Presence of the environment	opportunity for the transportation of people	NA	NA	A
26 Barren/Rock and Sand	0402 Transporters of People	17 Land	medium for and conditions that support the transportation of people	NA	NA	A
26 Barren/Rock and Sand	0503 Timber, Fiber, and Fur/Hide Subsisters	06 Natural materials	non-cultivated ornamental products or by-products (from cultivation) used ornamentally for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
26 Barren/Rock and Sand	0601 Experiencers and Viewers	02 Flora	organisms (i.e., flowers, plants, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
26 Barren/Rock and Sand	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
26 Barren/Rock and Sand	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
26 Barren/Rock and Sand	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
26 Barren/Rock and Sand	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
26 Barren/Rock and Sand	0603 Hunters	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be hunted	01.01.01.04	Wild animals and their outputs	
26 Barren/Rock and Sand	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	

<b>Environmental sub-class</b>	<b>Beneficiary Subcategory</b>	<b>FEGS</b>	<b>Importance</b>	<b>CICES Code</b>	<b>CICES description</b>	<b>Notes</b>
26 Barren/Rock and Sand	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
26 Barren/Rock and Sand	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
26 Barren/Rock and Sand	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
26 Barren/Rock and Sand	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
26 Barren/Rock and Sand	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
26 Barren/Rock and Sand	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
26 Barren/Rock and Sand	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
26 Barren/Rock and Sand	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
27 Tundra	0103 Livestock Grazers	02 Flora	non-cultivated vegetation for livestock consumption	01.02.01.02	Materials from plants, algae and animals for agricultural use	
27 Tundra	0103 Livestock Grazers	07 Open space	suitable conditions (i.e., land) to graze livestock	NA	NA	A
27 Tundra	0201 Food Extractors	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) for commercial use or sale	01.01.01.03	Wild plants, algae and their outputs	
27 Tundra	0201 Food Extractors	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) for commercial use or sale	01.01.01.04	Wild animals and their outputs	
27 Tundra	0205 Electric and other Energy Generators	03 Presence of the environment	opportunity to install power generation structures	NA	NA	A

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
27 Tundra	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of pest infestation on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B
27 Tundra	0207 Pharmaceutical and Food Supplement Suppliers	02 Flora	organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
27 Tundra	0207 Pharmaceutical and Food Supplement Suppliers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) or products associated with organisms (i.e., oils, fats, keratin, etc.) used in medicines or sold for medicinal purposes	01.02.01.03	Genetic materials from all biota	C
27 Tundra	0208 Fur/Hide Trappers and Hunters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides for commercial use or sale	01.01.01.04	Wild animals and their outputs	
27 Tundra	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of pest infestation on the property	03.01.02.05	Aesthetic	D
27 Tundra	0304 Military/Coast Guard	03 Presence of the environment	opportunity for placement of infrastructure	NA	NA	A
27 Tundra	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
27 Tundra	0401 Transporters of Goods	03 Presence of the environment	opportunity for the transportation of goods	NA	NA	A
27 Tundra	0401 Transporters of Goods	17 Land	medium for and conditions that support the transportation of goods	NA	NA	A
27 Tundra	0402 Transporters of People	03 Presence of the environment	opportunity for the transportation of people	NA	NA	A
27 Tundra	0402 Transporters of People	17 Land	medium for and conditions that support the transportation of people	NA	NA	A
27 Tundra	0502 Food Subsisters	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
27 Tundra	0502 Food Subsisters	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) that are hunted for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
27 Tundra	0503 Timber, Fiber, and Fur/Hide Subsisters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
27 Tundra	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	non-cultivated fiber for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
27 Tundra	0503 Timber, Fiber, and Fur/Hide Subsisters	05 Fiber	fiber used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
27 Tundra	0503 Timber, Fiber, and Fur/Hide Subsisters	06 Natural materials	non-cultivated ornamental products or by-products (from cultivation) used ornamentally for commercial use or sale	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
27 Tundra	0503 Timber, Fiber, and Fur/Hide Subsisters	14 Timber	timber (i.e., trees) used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.02.01.01, 01.03.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	B
27 Tundra	0601 Experiencers and Viewers	02 Flora	organisms (i.e., flowers, plants, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
27 Tundra	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
27 Tundra	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
27 Tundra	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
27 Tundra	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
27 Tundra	0602 Food Pickers and Gatherers	02 Flora	edible organisms (i.e., flowers, plants, etc.) or associated products (i.e., fruit, greens, tubers, berries, sap) that are picked and/or gathered for personal use (i.e., not for sale)	01.01.01.03	Wild plants, algae and their outputs	
27 Tundra	0603 Hunters	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be hunted	01.01.01.04	Wild animals and their outputs	
27 Tundra	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
27 Tundra	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
27 Tundra	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	
27 Tundra	0702 Artists	08 Viewscales	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
27 Tundra	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
27 Tundra	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
27 Tundra	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
27 Tundra	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
27 Tundra	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
28 Ice and Snow	0206 Resource-Dependent Businesses	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of avalanches on the property	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B
28 Ice and Snow	0208 Fur/Hide Trappers and Hunters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides for commercial use or sale	01.01.01.04	Wild animals and their outputs	
28 Ice and Snow	0303 Residential Property Owners	03 Presence of the environment	opportunity for placement of infrastructure and reduced/increased risk of avalanches on the property	03.01.02.05	Aesthetic	D
28 Ice and Snow	0304 Military/Coast Guard	03 Presence of the environment	opportunity for placement of infrastructure	NA	NA	A
28 Ice and Snow	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
28 Ice and Snow	0401 Transporters of Goods	03 Presence of the environment	opportunity for the transportation of goods	NA	NA	A

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
28 Ice and Snow	0401 Transporters of Goods	17 Land	medium for and conditions that support the transportation of goods	NA	NA	A
28 Ice and Snow	0402 Transporters of People	03 Presence of the environment	opportunity for the transportation of people	NA	NA	A
28 Ice and Snow	0402 Transporters of People	17 Land	medium for and conditions that support the transportation of people	NA	NA	A
28 Ice and Snow	0501 Water Subsisters	01 Water	water (from melting snow and ice) suitable for drinking (i.e., human consumption)	01.01.02.01	Surface water for drinking	
28 Ice and Snow	0502 Food Subsisters	04 Fauna	edible organisms (i.e., birds, mammals, reptiles, etc.) that are hunted for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
28 Ice and Snow	0503 Timber, Fiber, and Fur/Hide Subsisters	04 Fauna	organisms (i.e., mammals and reptiles) that provide fur or hides used for clothing/warmth, infrastructure, housing, roofing, and/or fuel for personal use (i.e., not for sale)	01.01.01.04	Wild animals and their outputs	
28 Ice and Snow	0504 Building Material Subsisters	16 Substrate	renewable, non-cellular material used for infrastructure, housing, and roofing (i.e., not for sale)	NA	NA	A
28 Ice and Snow	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
28 Ice and Snow	0601 Experiencers and Viewers	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
28 Ice and Snow	0601 Experiencers and Viewers	08 Viewscapes	landscape that provides a sensory experience	03.01.02.05	Aesthetic	D
28 Ice and Snow	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
28 Ice and Snow	0603 Hunters	04 Fauna	organisms (i.e., birds, mammals, reptiles, etc.) that can be hunted	01.01.01.04	Wild animals and their outputs	
28 Ice and Snow	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
28 Ice and Snow	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
28 Ice and Snow	0702 Artists	06 Natural materials	natural materials that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., sculpture, mixed media paintings, etc.)	01.02.01.01	Fibres and other materials from plants, algae and animals for direct use or processing	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
28 Ice and Snow	0702 Artists	08 Viewscapes	landscape that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
28 Ice and Snow	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
28 Ice and Snow	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
28 Ice and Snow	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
28 Ice and Snow	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	
28 Ice and Snow	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
31 Atmosphere	0102 CAFO Operators	01 Water	water (via precipitation) for livestock consumption	01.02.02.01	Surface water for non-drinking purposes	
31 Atmosphere	0102 CAFO Operators	03 Presence of the environment	opportunity to discharge odors into the environment	NA	NA	A
31 Atmosphere	0102 CAFO Operators	18 Air	medium for and capacity to dissipate odors produced by [dense herds of] livestock	NA	NA	A
31 Atmosphere	0102 CAFO Operators	19 Weather	for outdoor CAFOs, suitable atmospheric conditions [in temperature, precipitation, or wind] for livestock survival	NA	NA	A
31 Atmosphere	0103 Livestock Grazers	19 Weather	for outdoor CAFOs, suitable atmospheric conditions [in temperature, precipitation, or wind] for livestock survival	01.02.02.01	Surface water for non-drinking purposes	
31 Atmosphere	0106 Farmers	01 Water	water (via precipitation) for crops	01.02.02.01	Surface water for non-drinking purposes	
31 Atmosphere	0106 Farmers	19 Weather	suitable atmospheric conditions [in temperature, precipitation, or wind] for farming activities	NA	NA	A
31 Atmosphere	0107 Foresters	01 Water	water (via precipitation) for trees	01.02.02.01	Surface water for non-drinking purposes	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
31 Atmosphere	0107 Foresters	19 Weather	suitable atmospheric conditions [in temperature, precipitation, or wind] for forestry activities	NA	NA	A
31 Atmosphere	0204 Industrial Dischargers	03 Presence of the environment	opportunity to discharge into the environment	NA	NA	A
31 Atmosphere	0204 Industrial Dischargers	18 Air	medium for receiving industrial discharge	NA	NA	A
31 Atmosphere	0205 Electric and other Energy Generators	03 Presence of the environment	opportunity to install power generation structures	NA	NA	A
31 Atmosphere	0205 Electric and other Energy Generators	20 Wind	suitable wind speeds for power generation	04.03.01	Renewable abiotic energy sources	
31 Atmosphere	0206 Resource-Dependent Businesses	03 Presence of the environment	reduced/increased risk of damage of the property, for example, by lightning strikes	03.01.01, 03.01.02.04, 03.01.02.05	Physical and experiential interactions	B
31 Atmosphere	0206 Resource-Dependent Businesses	18 Air	suitable [clean /clear] air for establishing and maintaining property, and the opportunity for viewscapes	03.01.02.05	Aesthetic	D
31 Atmosphere	0206 Resource-Dependent Businesses	19 Weather	suitable atmospheric conditions [in temperature, precipitation, or wind] for establishing and maintaining property	NA	NA	A
31 Atmosphere	0303 Residential Property Owners	03 Presence of the environment	reduced/increased risk of damage of the property, for example, by lightning strikes	03.01.02.05	Aesthetic	D
31 Atmosphere	0304 Military/Coast Guard	03 Presence of the environment	opportunity for training activities	NA	NA	A
31 Atmosphere	0304 Military/Coast Guard	07 Open space	suitable conditions for training activities	NA	NA	A
31 Atmosphere	0401 Transporters of Goods	03 Presence of the environment	opportunity for the transportation of goods	NA	NA	A
31 Atmosphere	0401 Transporters of Goods	18 Air	medium for and conditions that support the transportation of goods	NA	NA	A
31 Atmosphere	0402 Transporters of People	03 Presence of the environment	opportunity for the transportation of people	NA	NA	A
31 Atmosphere	0402 Transporters of People	18 Air	medium for and conditions that support the transportation of people	NA	NA	A
31 Atmosphere	0501 Water Subsisters	01 Water	water (from precipitation) suitable for drinking (i.e., human consumption), specifically via cisterns	01.01.02.01	Surface water for drinking	

<b>Environmental sub-class</b>	<b>Beneficiary Subcategory</b>	<b>FEGS</b>	<b>Importance</b>	<b>CICES Code</b>	<b>CICES description</b>	<b>Notes</b>
31 Atmosphere	0601 Experiencers and Viewers	03 Presence of the environment	opportunity to view the environment and organisms within it, and atmospheric phenomena	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
31 Atmosphere	0601 Experiencers and Viewers	04 Fauna	organisms (specifically, birds) that can be viewed	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
31 Atmosphere	0601 Experiencers and Viewers	08 Viewscapes	sky that provides a sensory experience	03.01.02.05	Aesthetic	D
31 Atmosphere	0601 Experiencers and Viewers	09 Sounds and scents	sounds and scents that provide a sensory experience	03.01.02.05	Aesthetic	D
31 Atmosphere	0601 Experiencers and Viewers	18 Air	suitable [clean/clear] air for visibility	NA	NA	A
31 Atmosphere	0601 Experiencers and Viewers	20 Wind	wind for wind-dependent sports and recreation	03.01.01.01	Experiential use of plants, animals and land-/seascapes in different environmental settings	
31 Atmosphere	0601 Experiencers and Viewers	21 Atmospheric phenomena	atmospheric phenomena that can be viewed	NA	NA	A
31 Atmosphere	0606 Boaters	20 Wind	opportunity and conditions provided by wind for recreational [sail]boating	NA	NA	A
31 Atmosphere	0701 Spiritual and Ceremonial Participants and Participants of Celebration	03 Presence of the environment	opportunity and conditions for spiritual and ceremonial practices and celebrations	03.02.01.02	Sacred and/or religious	
31 Atmosphere	0702 Artists	03 Presence of the environment	opportunity for a sensory experience [which may lead to the benefit of inspiration for art]	03.02.01.01	Symbolic	
31 Atmosphere	0702 Artists	08 Viewscapes	sky that provides a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
31 Atmosphere	0702 Artists	09 Sounds and scents	sounds and scents that provide a sensory experience [which may lead to the benefit of inspiration for art] or can be directly used in art (e.g., films, soundtracks, etc.)	03.01.02.05	Aesthetic	D
31 Atmosphere	0801 Educators and Students	03 Presence of the environment	opportunities to understand, communicate, and educate	03.01.02.02	Educational	
31 Atmosphere	0802 Researchers	03 Presence of the environment	research opportunities	03.01.02.01	Scientific	
31 Atmosphere	0901 People Who Care (Existence)	03 Presence of the environment	knowing that the environment exists	03.02.02.01	Existence	

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
31 Atmosphere	0902 People Who Care (Option/Bequest)	03 Presence of the environment	knowing that the environment exists	03.02.02.02	Bequest	
31 Atmosphere	1001 All Humans	18 Air	suitable [healthful] air to breathe	NA	NA	A
NA	NA	NA		01.01.01.01	Cultivated crops	E
NA	NA	NA		01.01.01.02	Reared animals and their outputs	E
NA	NA	NA		01.01.01.05	Plants and algae from in-situ aquaculture	E
NA	NA	NA		01.01.01.06	Animals from in-situ aquaculture	E
NA	NA	NA		01.02.01.03	Genetic materials from all biota	E
NA	NA	NA		01.03.01.01	Plant-based resources	E
NA	NA	NA		01.03.01.02	Animal-based resources	E
NA	NA	NA		01.03.02.01	Animal-based energy	E
NA	NA	NA		02.01.01.01	Bio-remediation by micro-organisms, algae, plants and animals	E
NA	NA	NA		02.01.01.02	Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants and animals	E
NA	NA	NA		02.01.02.01	Filtration/sequestration/storage/accumulation by ecosystems	E
NA	NA	NA		02.01.02.02	Dilution by atmosphere, freshwater and marine ecosystems	E
NA	NA	NA		02.01.02.03	Mediation of smell/noise/visual impacts	E
NA	NA	NA		02.02.01.01	Mass stabilisation and control of erosion rates	E
NA	NA	NA		02.02.01.02	Buffering and attenuation of mass flows	E
NA	NA	NA		02.02.02.01	Hydrological cycle and water flow maintenance	E
NA	NA	NA		02.02.02.02	Flood protection	E
NA	NA	NA		02.02.03.01	Storm protection	E
NA	NA	NA		02.02.03.02	Ventilation and transpiration	E
NA	NA	NA		02.03.01.02	Maintaining nursery populations and habitats	E
NA	NA	NA		02.03.02.02	Disease control	E
NA	NA	NA		02.03.03.01	Weathering processes	E
NA	NA	NA		02.03.03.02	Decomposition and fixing processes	E
NA	NA	NA		02.03.04.02	Chemical condition of salt waters	E
NA	NA	NA		02.03.05.01	Global climate regulation by reduction of greenhouse gas concentrations	E
NA	NA	NA		02.03.05.02	Micro and regional climate regulation	E
NA	NA	NA		03.01.02.03	Heritage, cultural	E
NA	NA	NA		03.01.02.04	Entertainment	E
NA	NA	NA		04.01.01	Nutritional abiotic substances; Mineral	E
NA	NA	NA		04.01.02	Nutritional abiotic substances; Non-mineral	E
NA	NA	NA		04.02.01	Abiotic materials; Metallic	E
NA	NA	NA		04.02.02	Abiotic materials; Non-metallic	E
NA	NA	NA		04.03.02	Non-renewable energy sources	E
NA	NA	NA		05.01.01	Mediation of waste, toxics and other nuisances; By natural chemical and physical processes	E

Environmental sub-class	Beneficiary Subcategory	FEGS	Importance	CICES Code	CICES description	Notes
NA	NA	NA		05.02.01	Mediation of flows by natural abiotic structures; By solid (mass), liquid and gaseous (air)flows	E
NA	NA	NA		05.03.01	Maintenance of physical, chemical, abiotic conditions; By natural chemical and physical processes	E
NA	NA	NA		06.01.01	Physical and intellectual interactions with land-/seascapes [physical settings]; By physical and experiential interactions or intellectual and representational interactions	E
NA	NA	NA		06.02.01	Spiritual, symbolic and other interactions with land-/seascapes [physical settings]; By type	E

Adapted from the detailed FEGS tables available at [http://gispub4.epa.gov/FEGS/FEGS\\_home.html](http://gispub4.epa.gov/FEGS/FEGS_home.html).

Codes for Environmental sub-classes, beneficiary sub-categories and FEGS added by the author.

Notes:

A = FEGS triplet has no equivalent CICES class

B = One FEGS triplet implies two or more CICES classes

C = “Genetic materials” assumed as additional input to this benefit

D = Assumed “aesthetic” aspects also contribute to this benefit

E = CICES class has no equivalent FEGS triplet

F = CICES class includes both pollination and seed dispersal (FEGS triplet does not)