Restoration Ecology Thesaurus

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1.0 Introduction

1.1.0 What is the Restoration Ecology Thesaurus and Who is it for?

This thesaurus was developed to provide guidance for subject-based searching in the domain of restoration ecology. Restoration ecology is the academic study that supports the practice of ecological restoration. The Society for Ecological Restoration (SER) defines ecological restoration as "...the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed" (Gann, McDonald, & Walder, 2019). SER explains that ecological restoration focuses on the ecosystem, a functional assemblage of living and nonliving components that interact in a relatively stable condition that changes incrementally over time. Ecosystems can be damaged so that they are unable to function. Restoration involves initiating different activities such as invasive species removal or planting trees; such interventions are intended to help the ecosystem get to a state where it can repair itself and resume the trajectory it was on before the damage occurred. Damage to an ecosystem may come from humans, natural events or disasters, or global climate change (Gann, McDonald, & Walder, 2019).

This thesaurus is intended to be used by people who are relatively new to the theory and practice of restoration ecology as well as those who want to put knowledge into practice with their restoration efforts. The thesaurus can be used to index and retrieve a body of literature that includes scholarly journal articles and monographs, case studies, operational reports, technical reports, policy memos, white papers, and datasets.

1.2.0 What was Used to Construct the Restoration Ecology Thesaurus?

Terms and term relationships described in the thesaurus draw on a broad range of research literature in the field of restoration ecology as well as input from several experts. The defining and scoping of terms is also informed by a number of glossaries and existing indexes in the field, including the glossary associated with the Society for Ecological Restoration's *International Principles and Standards for the Practice of Ecological Restoration, 2nd ed.* (Gann, McDonald, & Walder, 2019), the Ecological Restoration Institute Library's subject terms (ERI, n.d.), and the United Nations Food and Agriculture Organization term portal (FAO, n.d.).

1.3.0 Thesaurus Contents

The Restoration Ecology Thesaurus contains 100 preferred terms and 203 non-preferred terms. These terms have been structured into three major tools that will help you search and index relevant documents. These tools include an Alphabetical Schedule, a Classified Schedule, and a Named Geographic Entity List.

1.3.1 Preferred Terms

Preferred terms, also called indexing terms or descriptors, are standardized words or phrases that can be used to describe a piece of literature and then used to search within a catalog of all works indexed using the same thesaurus. With preferred terms, the same word is used to describe the same concept across the entire domain; thus, the ability to discover items within a catalog becomes much easier and the user will be able to find materials that might not have been found otherwise due to inconsistent vocabulary. Since this thesaurus is intended to be used by relative novices, simpler terms have in many cases been preferred over more academic language. Preferred terms adhere to the following:

- Spelling of terms is in American English; additional spellings, as relevant, are treated as non-preferred terms.
- Terms are written in the plural form; exceptions include agents, products, processes, and complex entities.
- Apostrophes, hyphens, and accents, while not presently included, are subject to addition as the thesaurus grows

1.3.2 Non-Preferred Terms

Non-preferred terms are terms that are used in the domain of restoration ecology, but aren't used as indexing terms in this thesaurus. Non-preferred terms may be synonyms of preferred terms; they may also be words for similar but not identical concepts. In addition, non-preferred terms can be narrower concepts that are related to, but can be embodied by, broader-concept preferred terms. For example, the preferred term *restoration* can be used for the non-preferred terms of reforestation, afforestation, and rewilding. Use of a single term for a cluster of related concepts simplifies the process of both indexing and searching.

1.3.3 The Classified Schedule

The Classified Schedule is a formal list of all preferred terms for this thesaurus. The Classified Schedule communicates the *relationships* among preferred terms and thereby where they are conceptually situated in the total field of restoration ecology. Terms are broadly organized into

six thematic groups (which are called facets), and then presented in hierarchies of increasing specificity.

For further discussion, see **Reading Entries in the Restoration Ecology Thesaurus** below. Browse the Classified Schedule if you would like to familiarize yourself with the field, get a sense of what you might like to search for, or begin to expand the parameters of your search.

1.3.4 The Alphabetical Schedule

The Alphabetical Schedule is a formal list of preferred and non-preferred terms intended to assist users in locating and selecting the best preferred terms for their specific needs. All terms are presented in alphabetical order; preferred terms are in **Boldface** with initial capitalization and non-preferred terms are in non-bold type with no capitalization. Entries for non-preferred terms will refer you to the best preferred term to use instead, and entries for preferred terms will provide referrals to other conceptually or hierarchically related preferred terms as well as, in some cases, definitions and/or recommendations for how to use the term.

For further discussion, see **Reading Entries in the Restoration Ecology Thesaurus** below. Browse the Alphabetical Schedule if you already have a set of subjects that you intend to explore but are unsure what terms to use for searching, and would like to determine how best to begin or how to expand your search.

1.3.5 The Named Geographic Entity List

The Named Geographic Entity List is a formal list of thirteen standardized names for the geographic regions—aquatic and terrestrial—that constitute the globe. The list is intended to ensure that users can most effectively search for literature concerning a given region by collecting together and standardizing variants of regional names and by clarifying regional scope. The division of the world's oceans, and their standardized names, were selected in accordance with the International Hydrographic Organization's 4th edition of its *Limits of Oceans and Seas* (IHO, 2002). While the 4th edition has not yet been ratified by all IHO member states, it is the *de facto* standard utilized by researchers in the majority of IHO member states and contains significant updates from the 1953 3rd edition. The division of the world's terrestrial regions, and their standardized names, were selected in accordance with the United Nations Statistical Division's *Standard Geographic Regions* (UNSD, 2019).

For further discussion, see **Reading Entries in the Restoration Ecology Thesaurus** below. Due to the high level at which geographic regions are named, these entities do not integrate with the thesaurus' preferred subject terms in a way that would be useful for users. For that reason, there are no cross-references between the named geographic entity list and the rest of the thesaurus, but users may include both named geographic entities and preferred subject terms in their searching and indexing.

1.4.0 Reading entries in the Restoration Ecology Thesaurus

Each tool in the thesaurus—the Alphabetical Schedule, the Classified Schedule, and the named entity list—is made up of uniquely structured, tool-specific entries. See below for an introduction to each entry type.

1.4.1 Alphabetical Schedule Entries

Entries for preferred terms in the Alphabetical Schedule include a variable set of elements to further describe the term's intended usage and its relationship to broader and narrower concepts in the field of restoration ecology. Preferred term entries can include any or all of the following, as relevant:

- A **Scope Note (SN)**, which clarifies how this term is intended to be used for indexing, and delineates it from other terms in the thesaurus .
- **Use For (UF)** terms, which are the non-preferred terms for which the preferred term should be used—these terms are neither bold nor capitalized in the schedule
- **A Broader Term (BT)** is another preferred term that is conceptually broader; a BT is derived from the hierarchy within the Classified Schedule and is also represented within the Alphabetical Schedule.
- **Narrower Term(s) (NT)** are preferred terms that are conceptually narrower; NTs are derived from the hierarchy within the Classified Schedule and are also represented within the Alphabetical Schedule.
- **Related Terms (RT)** are preferred terms that are conceptually or functionally related and therefore of potential interest or relevance; RTs are also represented within the Alphabetical Schedule.

All preferred terms in the Alphabetical Schedule are accompanied by a **bracketed notation** (for example, [A3N]) that directs the user to the location of that term in the Classified Schedule. The notation reflects the position of the term within the hierarchy presented in the Classified Schedule—when entering the Classified Schedule, use the first letter of the notation as an initial orienting device to guide you to the appropriate facet, and work from there.

Example of a preferred term entry in the Alphabetical Schedule.

Notation		**Example from schedule**	
Preferred term [Bracketed notation]		**Terrestrial ecosystems [A3N]**	
SN	Scope note	SN	Use for ecosystems in which land is dominant over water.
UF	Use for terms (non-preferred)	UF	heathlands shrublands
BT	Broader term (preferred)	BT	Ecosystems [A3]

NT Narrower terms (preferred) RT Related terms (preferred)	NT Alpine ecosystems [A3N1] Deserts [A3N2] Forests [A3N3] Grasslands [A3N4] Islands [A3N5] Tundra [A3N6] RT Marine ecosystems [A3M2] Prairies [A3N4A] Seeds [B1P1] Soils [B2N]

Each entry for a non-preferred (UF) term in the Alphabetical Schedule presents the term aligned to the left but in non-bold type and with no capitalization; it contains a recommendation for the preferred term to use in its place (Use).

Example of a non-preferred (UF) term entry in the Alphabetical Schedule.

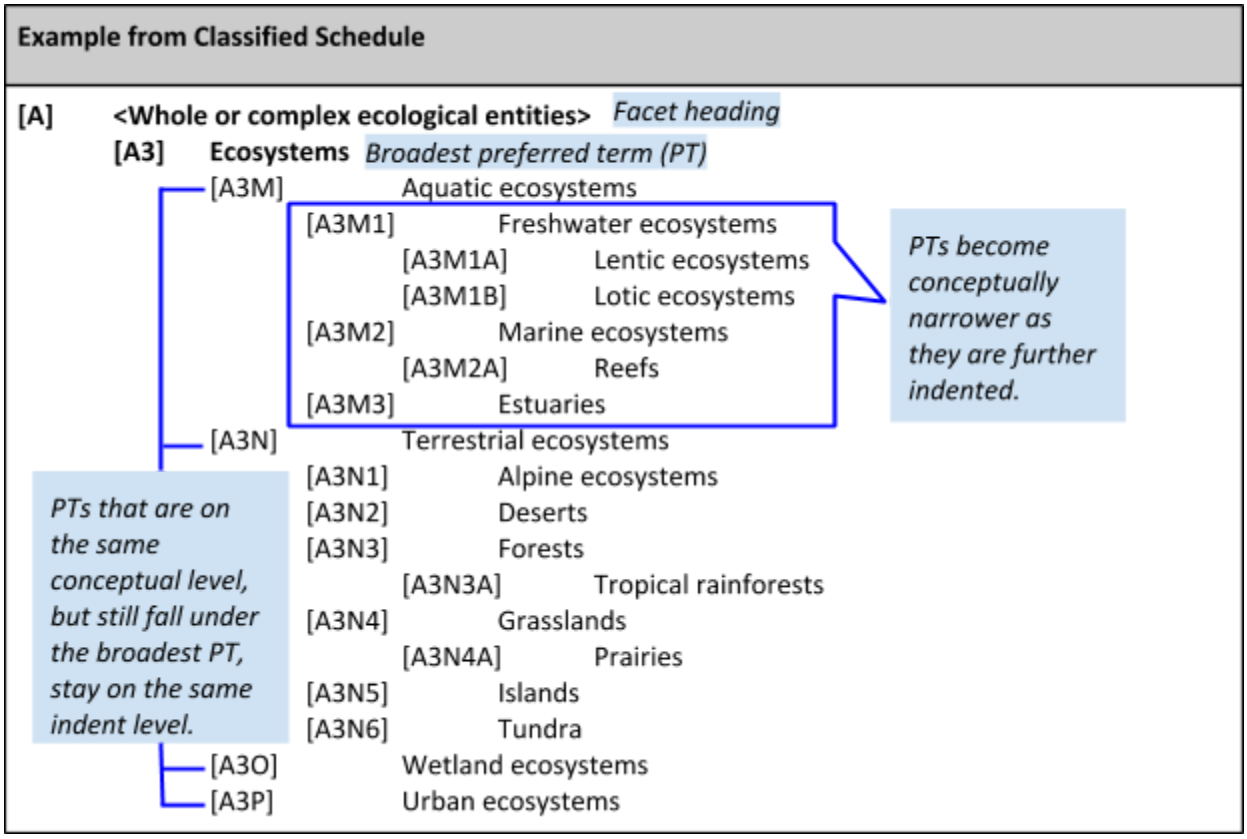
Notation	**Example from schedule**
non-preferred term Use Preferred term	heathlands Use Terrestrial ecosystems [A3N]

1.4.2 Classified Schedule Entries

Each facet section in the Classified Schedule presents a facet heading (indicated by **<bolded angle brackets>**) followed by the set of preferred terms that fall within that heading. Increasing indentation represents the hierarchical relationships between terms. All terms in the Classified Schedule are accompanied by a bracketed notation (for example, [A3N]) that is meant to assist you in moving between the Alphabetical and Classified Schedules.

Consider, again, **Terrestrial ecosystems** [A3N]. Terrestrial ecosystems are a type of ecosystem and as such **Terrestrial ecosystems** is a narrower term in relation to **Ecosystems**, which is represented by a single indentation. This narrowing of relationships continues with Grasslands [A3N4] and Prairies [A3N4A]. **Aquatic ecosystems**, **Terrestrial ecosystems**, **Wetland ecosystems** and **Urban ecosystems** exist at the same level in the hierarchy because they are all conceptually discrete ecosystem types.

Example facet and hierarchy in the Classified Schedule.



1.4.3 Named Geographic Entity List Entries

Each entry in the geographic named entity list presents the entity's standardized name form, followed first by a scope note (SN) that delineates the entity's scope of coverage and the source for its standardization, and followed second by a set of variant terms (UF) for which the standardized name should be used. Variant terms are included selectively: the thesaurus does not name every locality covered by the standardized name (in the **Arctic Ocean** example, that might involve listing every region of the **Arctic Ocean** and every marginal body of water) and instead lists quasi-synonymous name variants and very large geographic subdivisions (for example, North Atlantic Ocean and South Atlantic Ocean as variants of **Atlantic Ocean**).

Example entry in Named Geographic Entity List.

Notation	Example from named entity list
Named Entity SN Scope note	**Arctic Ocean** SN Refers to the hydrogeographic area contained within the Arctic ocean basin, including the Arctic ice pack, and to the ocean's marginal

UF Use for terms	bodies of water, such as the Laptev Sea, Hudson Bay, and Baffin Bay. The term is selected for authority and scoped as stated per the International Hydrographic Organization's 4th edition (2002) of its *Limits of Oceans and Seas.* UF Arctic ice pack Arctic ice cap The Arctic

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1.5.0 Using the Restoration Ecology Thesaurus

With a solid understanding of the structure and function of each tool in the thesaurus, you can turn to the practical work of searching for or indexing literature.

1.5.1 Recommendations for Searching with this Thesaurus

This thesaurus contains 100 preferred terms and 203 non-preferred terms, which can be used to locate the preferred term best suited to your search. Scan the Alphabetical Schedule for a term or terms that reflect the subject that you are searching for. If that term is a non-preferred term, follow the reference to a recommended preferred term. Once you've located a relevant preferred term, explore the scope notes, broader terms and narrower terms associated with the term. Is a broader or narrower term better suited to your search? Also explore the related terms. Might they point you in a useful direction?

This thesaurus works with a post-coordinate structure. Individual terms in the thesaurus are simple building blocks and users have the opportunity to combine them in order to create more complex searches. You will not find a term for "grassland habitat fragmentation" in the thesaurus—instead, you can construct that search yourself by combining individual terms. A post-coordinate system allows the user to enter terms in any order using Boolean operators (AND, OR, NOT, or AND NOT) and retrieve results of specific and related works. Being able to use more terms allows for greater recall but less precision, but it is more likely that works related to what is searched for will be found. Any term can be combined with any other term in an attempt to accurately express the subject for which you are searching.

Scope notes in the Alphabetical Schedule can provide additional assistance in constructing searches. Scope notes may recommend the terms that should be combined to produce a desired result common in the field of restoration ecology. For instance, the scope note for the preferred term **Biodiversity** recommends that searchers combine the term with another preferred term, **Genetics,** in order to search for literature concerning *genetic diversity*, which is an important subtype of biodiversity.

Consider the following examples.

You would like to locate literature concerning grassland habitat fragmentation, per the example above. What might you do?
1. Scan for "grassland" in the Alphabetical Schedule and you will locate the preferred term **Grasslands**. You might choose to search with this term, or to narrow your search by using the associated narrower term **Prairies** if applicable. 2. Scan for "habitat" in the Alphabetical Schedule and you will locate the preferred term **Habitats**. 3. Scan for "fragmentation" in the Alphabetical Schedule and you will locate the preferred term **Fragmentation.** You might choose to search with this term, or to broaden your search by using the associated broader term **Degradation**, which would lead you to all forms of habitat degradation. 4. Combine your located terms in one advanced search. For example, search for **Grasslands** AND **Habitats** AND **Fragmentation**.

You would like to locate literature concerning the removal of toxins from lakes. What might you do?
1. Scan for "toxins" in the Alphabetical Schedule and you will locate the preferred term **Toxins**. 2. Scan for "lakes" in the Alphabetical Schedule and you will locate the non-preferred term lakes, which indicates that the preferred term **Lentic ecosystems** should be used in its place. 3. Combine your located terms in one advanced search: **Toxins** AND **Lentic ecosystems**. 4. If you would like to narrow your search to more closely reflect your original search goal, consider exploring the related terms (RT) associated with the terms you've already identified. In this case, you might notice that **Remediation** is listed as a related term for **Toxins**. If you turn to the Remediation entry in the Alphabetical Schedule, you'll find that **Remediation** is used to describe "interventions intended to remove sources of degradation, i.e. the removal or detoxification of contaminants." You might then try the following advanced search: **Toxins** AND **Lentic ecosystems** AND **Remediation.**

1.5.2 Recommendations for Indexing with this Thesaurus

First, familiarize yourself with the experience of searching in this thesaurus, referring to **Recommendations for Searching with this Thesaurus** as useful. After performing a subject analysis for your given piece of literature, scan the Alphabetical Schedule (or Classified Scheduled as preferred) for terms that could reflect the subjects under discussion, either independently or through post-coordination. Use non-preferred terms as a means to access the best-suited preferred terms, and use all information in preferred term entries to determine the relative applicability and scope of coverage for a given term. Consider the many avenues through which a user might seek out the piece of literature at hand, and work to address each of them.

2.0 Alphabetical Schedule

Abiotic factors [B2]
- SN Use for non-living materials and conditions in an ecosystem.
- UF abiotic components
  rocks
  wind
- NT Nutrients [B2P]
  Pollution [B2O]
  Soils [B2N]
  Temperature [B2Q]
  Toxins [B2R]
  Water [B2M]
- RT Biotic communities [B1]
  Deserts [A3N2]

abiotic components
- Use Abiotic factors [B2]

acid rain
- Use Pollution [B2O]

adaptation
- Use Natural selection [E5]

Adaptive management [C2X2]
- BT Management [C2X]
- RT Assessment [C2U]
  Planning [C2V]

afforestation
- Use Restoration [C2P]

Agriculture [F1]
- UF crops
  farmland
- RT Grasslands [A3N4]
  Land management [C2X1]
  Overexploitation [C1M]
  Plants [B1P]
  Pollution [B2O]
  Public policy [F7]
  Reclamation [C2O1]
  Seeds [B1P1]
  Sustainability [F8]
  Tropical rainforests [A3N3A]

air pollution
- Use Pollution [B2O]

alien species
- Use Non-native species [A5M5]

Alpine ecosystems [A3N1]
BT Terrestrial ecosystems [A3N]
RT Forestry [F3]

Animals [B1M]
SN Use for works that principally concern members of the animal kingdom. For animal populations, use **Animals** + **Populations [A5]**. For particular animal species and for the roles or characteristics of species within an ecosystem, use **Animals** + **Species [A5M]** terms or **Species Interactions [E6]**. For animal habitats, use **Animals** + **Habitats [A4]** and/or terms for relevant types of ecosystems.
UF birds
fauna
fish
insects
megafauna
BT Biotic communities [B1]
RT Habitats [A4]
Invasive species [A5M3]
Native species [A5M4]
Non-native species [A5M5]
Pollination [C3M]
Populations [A5]
Propagation [C2S]
Species [A5M]
Species interactions [E6]
Succession [E7]

anthropogenic disturbances
Use Disturbances [C1]

apex predators
Use Species interactions [E6]

Aquatic ecosystems [A3M]
SN Use for ecosystems in which water is dominant over land.
UF saline lakes
BT Ecosystems [A3]
NT Estuaries [A3M3]
Freshwater ecosystems [A3M1]
Marine ecosystems [A3M2]
RT Fisheries [F2]
Islands [A3N5]
Water [B2M]
Wetland ecosystems [A3O]

Assessment [C2U]
SN Use for assessment of ecosystem health, assessment of the efficacy of restoration projects, and testing of ecosystem components (i.e. **Soils [B2N]** or **Water [B2M]**).
UF evaluation
functional targets
monitoring
performance measures
testing

BT Interventions [C2]
NT Metrics [C2U1]
RT Adaptive management [C2X2]
Critical thresholds [D4]
Funding [F4]
Keystone species [A5M2]
Management [C2X]
Planning [C2V]
Resilience [D7]
Soils [B2N]
Water [B2M]

assisted colonization
Use Assisted migration [C2R]

Assisted migration [C2R]
SN Refers to a conservation strategy that involves moving species or ecotypes from an environment that has become hazardous (i.e. due to climate change) to a place with suitable living conditions, in order to prevent extinction.
UF assisted colonization
assisted relocation
managed relocation
BT Interventions [C2]
RT Conservation [C2M]
Extinction [D6]
Migration [E4]

assisted regeneration
Use Passive restoration [C2P2]

assisted relocation
Use Assisted migration [C2R]

Augmentation [C2Q]
SN Refers to re-establishing or strengthening a recently destroyed or depleted population of desirable organisms with individuals propagated from that population.
UF enhancement
enrichment
replenishment
restocking
BT Interventions [C2]
RT Extirpation [C2T]
Keystone species [A5M2]

bacteria
Use Microbes [B1O]

Balance [D1]
SN Refers to dynamic equilibrium within biotic communities in which biodiversity remains relatively stable although subject to incremental changes in composition.
RT Biodiversity [D2]
Critical thresholds [D4]
External exchanges [E2]
Habitats [A4]
Indigenous peoples [F5]

Keystone species [A5M2]
Management [C2X]
Nutrients [B2P]
Species [A5M]
Species interactions [E6]
Succession [E7]

barriers

Use Fragmentation [D5M]

Biocultural restoration [C2P1]

SN Refers to restoration in the context of continued human activity. Use for concepts related to functioning ecosystems inclusive of humankind.

UF cultural landscapes
social-ecological systems

BT Restoration [C2P]

RT Fisheries [F2]
Forestry [F3]
Human-dominated landscapes [A1M]
Indigenous peoples [F5]
Integrated management [C2X3]
Landscapes [A1]
Management [C2X]
Sustainability [F8]
Traditional Ecological Knowledge [F9]

Biodiversity [D2]

SN for *genetic diversity* use **Biodiversity [D2]** + **Genetics [E3]**, for *species diversity* use **Biodiversity [D2]** + **Species [A5M],** for *ecosystem diversity* use **Biodiversity [D2]** + **Ecosystems [A3]**

UF genetic diversity
species diversity
ecosystem diversity

RT Balance [D1]
Ecosystems [A3]
Genetics [E3]
Habitats [A4]
Species [A5M]

Biotic communities [B1]

SN Refers to species that live and interact in the same environment and, together with the **Abiotic factors [B2]** in the same area, constitute an ecosystem.

UF communities

NT Animals [B1M]
Fungi [B1N]
Microbes [B1O]
Plants [B1P]

RT Abiotic factors [B2]
Landscapes [A1]
Succession [E7]

bogs

Use Wetland ecosystems [A3O]

boreal forests
Use Forests [A3N3]
birds
Use Animals [B1M]
carbon sequestration
Use Ecosystem services [C3]
civil engineering
Use Planning [C2V]
Climate change [C1N]
SN Use for large-scale alterations in climate caused by disturbances such as volcanic eruptions, impact events, and human activities. Climate change is itself a disturbance factor that acts upon ecosystems.
UF global warming
BT Disturbances [C1]
RT Extinction [D6]
Habitats [A4]
Migration [E4]
Temperature [B2Q]
Tundra [A3N6]
climate regulation
Use Ecosystem services [C3]
colonization
Use Migration [E4]
commensalism
Use Species interactions [E6]
communities
Use Biotic communities [B1]
companion planting
Use Species interactions [E6]
competition
Use Species interactions [E6]
compositional change
Use Succession [E7]
Connectivity [D3]
SN Refers to the extent to which a landscape facilitates or impedes movement of organisms.
UF dispersal vectors
RT Fragmentation [D5M]
Habitats [A4]
Landscapes [A1]
Conservation [C2M]
SN Use for efforts to maintain ecosystem health and functioning at existing levels.
UF conservation tillage
BT Interventions [C2]
NT Mitigation [C2M1]
RT Assisted migration [C2R]
Degradation [D5]
Public policy [F7]

Sustainability [F8]

conservation tillage

Use Conservation [C2M]

control

Use Management [C2X]

Critical thresholds [D4]

UF ecological thresholds
threshold of irreversibility

RT Assessment [C2U]
Balance [D1]
Degradation [D5]
Metrics [C2U1]

cover crops

Use Soils [B2N]

crops

Use Agriculture [F1]

cultural landscapes

Use Biocultural restoration [C2P1]

Cycling [E1]

SN Refers to the repeated movement of fundamental materials, such as water, carbon, and nitrogen, through all components of an ecosystem.

UF nutrient cycling

RT Ecosystem services [C3]
Nutrients [B2P]
Plants [B1P]
Soils [B2N]

Degradation [D5]

SN Refers to damage to an ecosystem caused by disturbances and resulting in loss of ecosystem functioning, depletion of natural resources, habitat destruction, and/or reduced biodiversity. Use with affected ecosystem type where relevant.

UF depletion
desertification
eutrophication
siltation

NT Fragmentation [D5M]

RT Conservation [C2M]
Critical thresholds [D4]
Disturbances [C1]
Extinction [D6]
Mitigation [C2M1]

depletion

Use Degradation [D5]

desertification

Use Degradation [D5]

Deserts [A3N2]

BT Terrestrial ecosystems [A3N]

RT Abiotic factors [B2]
Temperature [B2Q]

Water [B2M]

Design [C2W]

BT Interventions [C2]
NT Landscape architecture [C2W1]
RT Planning [C2V]
Urban ecosystems [A3P]

Disease [C1R]

BT Disturbances [C1]
RT Microbes [B1O]
Pollution [B2O]
Toxins [B2R]

dispersal vectors

Use Connectivity [D3]

disturbance factors

Use Disturbances [C1]

disturbance regimes

Use Disturbances [C1]

Disturbances [C1]

SN Refers to an environmental event of natural or human origin that causes a significant change in an ecosystem; the event may be temporary or occur over a period of time.
UF anthropogenic disturbances
disturbance regimes
grazing
landfills
logging
mining
natural disturbances
perturbation
stress
NT Climate change [C1N]
Disease [C1R]
Erosion [C1Q]
Fire [C1O]
Flooding [C1P]
Overexploitation [C1M]
RT Degradation [D5]
Fisheries [F2]
Forestry [F3]
Pollution [B2O]
Species interactions [E6]
Succession [E7]

diversity

Use Biodiversity [D2]

ecocentric restoration

Use Restoration [C2P]

ecological economics

Use Ecosystem valuation [C4]

ecological thresholds

Use Critical thresholds [D4]

ecosystem diversity

Use Biodiversity [D2]

ecosystem counteractive capacity

Use Resilience [D7]

ecosystem engineers

Use Keystone species [A5M2]

ecosystem fragmentation

Use Fragmentation [D5M]

Ecosystem services [C3]

SN Refers to functions of ecosystems that are directly or indirectly beneficial to humanity.

UF carbon sequestration
climate regulation
environmental purification
filtering
global ecosystem services
hydrological services
oxygen production
recreation
soil conservation
urban ecosystem services

NT Pollination [C3M]

RT Cycling [E1]
Ecosystem valuation [C4]
Management [C2X]
Rehabilitation [C2O]

Ecosystem valuation [C4]

SN Use for the theory and practice of assigning monetary value to the products and services an ecosystem provides to the benefit of humanity.

UF ecological economics
natural capital
natural resources

RT Ecosystem services [C3]
Funding [F4]
Interventions [C2]
Metrics [C2U1]
Public policy [F7]

Ecosystems [A3]

SN Refers to a functional assemblage of biotic (living) and abiotic (nonliving) components that interact to form food webs, nutrient cycles, and energy flows.

UF environments
natural systems

NT Aquatic ecosystems [A3M]
Terrestrial ecosystems [A3N]
Wetland ecosystems [A3O]
Urban ecosystems [A3P]

RT Biodiversity [D2]
Landscapes [A1]

Populations [A5]
Prairies [A3N4A]

ecotourism
Use Outreach programs [F6]

ecotypes
Use Species [A5M]

Endangered species [A5M1]
SN Use for species particularly sensitive to extinction threats, including species classified as vulnerable, threatened, and endangered.
UF threatened species
BT Species [A5M]
RT Extinction [D6]

endemic species
Use Native species [A5M4]

enhancement
Use Augmentation [C2Q]

enrichment
Use Augmentation [C2Q]

environmental purification
Use Ecosystem services [C3]

environments
Use Ecosystems [A3]

eradication
Use Extirpation [C2T]

Erosion [C1Q]
SN Use specifically for the erosion of soil and geological entities.
BT Disturbances [C1]
RT Plants [B1P]
Soils [B2N]
Water [B2M]

establishment
Use Propagation [C2S]

Estuaries [A3M3]
BT Aquatic ecosystems [A3M]
RT Marine ecosystems [A3M2]
Water [B2M]
Wetland ecosystems [A3O]

eutrophication
Use Degradation [D5]

evaluation
Use Assessment [C2U]

evolution
Use Natural selection [E5]

evolutionary pressure
Use Natural selection [E5]

exotic species
Use Non-native species [A5M5]

External exchanges [E2]

SN Use for bidirectional flows between units of an environment (for example, flows of organisms, genetic material, water, fire or energy)
UF habitat linkages
RT Balance [D1]
Nutrients [B2P]

Extinction [D6]
SN Refers to the eradication, by natural or other means, of all living members of a species.
RT Assisted migration [C2R]
Climate change [C1N]
Degradation [D5]fish
Endangered species [A5M1]
Habitats [A4]
Species [A5M]

Extirpation [C2T]
SN Use for the intentional eradication of an undesirable species population within the area of a restoration project, i.e. removal of a noxious weed species.
UF eradication
BT Interventions [C2]
RT Augmentation [C2Q]
Invasive species [A5M3]
Management [C2X]
Species [A5M]

farmland
Use Agriculture [F1]

fauna
Use Animals [B1M]

filtering
Use Ecosystem services [C3]

Fire [C1O]
SN Use in the context of natural or anthropogenic disturbances on ecosystems.
UF prescribed burns
BT Disturbances [C1]
RT Flooding [C1P]
Forests [A3N3]
Grasslands [A3N4]
Management [C2X]
Succession [E7]
Tropical rainforests [A3N3A]fish

fish
Use Animals [B1M]

Fisheries [F2]
RT Aquatic ecosystems [A3M]
Biocultural restoration [C2P1]
Disturbances [C1]
Marine ecosystems [A3M2]
Overexploitation [C1M]
Sustainability [F8]
Water [B2M]

fishing rights
Use Indigenous peoples [F5]

Flooding [C1P]
SN Use in the context of natural or anthropogenic disturbances on ecosystems.
BT Disturbances [C1]
RT Fire [C1O]
Lotic ecosystems [A3M1B]
Succession [E7]
Watersheds [A2]

floodplains
Use Lotic ecosystems [A3M1B]

flora
Use Plants [B1P]

foreign species
Use Non-native species [A5M5]

Forestry [F3]
RT Alpine ecosystems [A3N1]
Biocultural restoration [C2P1]
Disturbances [C1]
Forests [A3N3]
Land management [C2X1]
Overexploitation [C1M]
Plants [B1P]
Sustainability [F8]

Forests [A3N3]
UF boreal forests
woodlands
BT Terrestrial ecosystems [A3N]
NT Tropical rainforests [A3N3A]
RT Fire [C1O]
Forestry [F3]
Fungi [B1N]
Restoration [C2P]

Fragmentation [D5M]
SN Use for the breaking up of a formerly contiguous living space or geographical range into smaller units. For *ecosystem fragmentation*, use **Fragmentation [D5M] + Ecosystems [A3]**, for *habitat fragmentation* use **Fragmentation [D5M] + Habitats [A4]**, for *landscape fragmentation* use **Fragmentation [D5M] + Landscapes [A1]**, for *population fragmentation* use **Fragmentation [D5M] + Populations [A5].**
UF barriers
habitat fragmentation
landscape fragmentation
population fragmentation
BT Degradation [D5]
RT Connectivity [D3]
Genetics [E3]
Habitats [A4]
Human-dominated landscapes [A1M]

Landscapes [A1]

framework species

Use Keystone species [A5M2]

Freshwater ecosystems [A3M1]

BT Aquatic ecosystems [A3M]

NT Lentic ecosystems [A3M1A]

Lotic ecosystems [A3M1B]

RT Islands [A3N5]

Water [B2M]

Watersheds [A2]

Wetland ecosystems [A3O]

functional targets

Use Assessment [C2U]

Funding [F4]

SN Use for any discussion of funding sources and processes for restoration activities.

UF grants

RT Assessment [C2U]

Ecosystem valuation [C4]

Interventions [C2]

Outreach programs [F6]

Planning [C2V]

Public policy [F7]

Fungi [B1N]

UF mycorrhizae

BT Biotic communities [B1]

RT Forests [A3N3]

Plants [B1P]

Soils [B2N]

gas emissions

Use Pollution [B2O]

gene flows

Use Genetics [E3]

genetic diversity

Use Biodiversity [D2]

Genetics [E3]

UF gene flows

hybridization

RT Biodiversity [D2]

Fragmentation [D5M]

Migration [E4]

Natural selection [E5]

Populations [A5]

Species [A5M]

germination

Use Seeds [B1P1]

global ecosystem services

Use Ecosystem services [C3]

global warming

Use Climate change [C1N]

government regulations

Use Public policy [F7]

grants

Use Funding [F4]

Grasslands [A3N4]

BT Terrestrial ecosystems [A3N]

NT Prairies [A3N4A]

RT Agriculture [F1]

Fire [C1O]

grazing

Use Disturbances [C1]

Groundwater [B2M1]

BT Water [B2M]

RT Pollution [B2O]

Remediation [C2N]

Toxins [B2R]

Watersheds [A2]

guilds

Use Species [A5M]

habitat fragmentation

Use Fragmentation [D5M]

Habitats [A4]

SN Refers to the particular natural environments in which specific organisms live. Use for unspecified natural or wild environments.

UF wilderness

RT Animals [B1M]

Balance [D1]

Biodiversity [D2]

Climate change [C1N]

Connectivity [D3]

Extinction [D6]

Fragmentation [D5M]

Keystone species [A5M2]

Landscapes [A1]

Migration [E4]

Populations [A5]

Species [A5M]

Succession [E7]

habitat linkages

Use External exchanges [E2]

heat

Use Temperature [B2Q]

heathlands

Use Terrestrial ecosystems [A3N]

Human-dominated landscapes [A1M]

UF urbanization

BT Landscapes [A1]

RT Biocultural restoration [C2P1]
Fragmentation [D5M]
Pollution [B2O]
‘ Public policy [F7]
Sustainability [F8]
Urban ecosystems [A3P]

hybridization
Use Genetics [E3]

hydrological services
Use Ecosystem services [C3]

indicator species
Use Keystone species [A5M2]

Indigenous peoples [F5]
UF fishing rights
Native Americans
RT Balance [D1]
Biocultural restoration [C2P1]
Management [C2X]
Public policy [F7]
Sustainability [F8]
Traditional Ecological Knowledge [F9]

indigenous species
Use Native species [A5M4]

insects
Use Animals [B1M]

Integrated management [C2X3]
SN Refers to a pest management approach that uses a combination of two or more control methods (chemical, biological, mechanical, and cultural).
UF integrated pest management
BT Management [C2X]
RT Biocultural restoration [C2P1]
Invasive species [A5M3]
Sustainability [F8]

Integrated pest management
Use Integrated management [C2X3]

Interventions [C2]
SN Use for action or deliberate inaction towards an ecological purpose. For interventions specific to an ecosystem or an entity, use both terms; e.g. for oxygenation of water, use **Interventions [C2]** + **Water [B2M].**
UF oxygenation
NT Assessment [C2U]
Assisted migration [C2R]
Augmentation [C2Q]
Conservation [C2M]
Design [C2W]
Extirpation [C2T]
Management [C2X]
Planning [C2V]

Propagation [C2S]
Rehabilitation [C2O]
Remediation [C2N]
Restoration [C2P]
RT Ecosystem valuation [C4]
Funding [F4]
Plants [B1P]
Public policy [F7]

interplanting
Use Species interactions [E6]

intertidal zones
Use Marine ecosystems [A3M2]

Invasive species [A5M3]
SN Use for species populations that are ecologically harmful because they reduce biodiversity in an area; invasive species are commonly, but not exclusively, non-native.
UF invasives
weeds
noxious weeds
BT Species [A5M]
RT Animals [B1M]
Extirpation [C2T]
Integrated management [C2X3]
Native species [A5M4]
Non-native species [A5M5]
Species interactions [E6]

invasives
Use Invasive species [A5M3]

irrigation
Use Water [B2M]

Islands [A3N5]
BT Terrestrial ecosystems [A3N]
RT Aquatic ecosystems [A3M]
Freshwater ecosystems [A3M1]
Landscapes [A1]
Marine ecosystems [A3M2]
Reefs [A3M2A]

Keystone species [A5M2]
SN Use for species that are critical to the survival and stable functioning of the other species in a system (for example, ecosystem engineers), and for species that for planning or assessment purposes are used to exemplify larger aspects of their environment.
UF framework species
ecosystem engineers
indicator species
proxy species
surrogate species
BT Species [A5M]
RT Assessment [C2U]

Augmentation [C2Q]
Balance [D1]
Habitats [A4]
Native species [A5M4]
Planning [C2V]
Species interactions [E6]

lakes
Use Lentic ecosystems [A3M1A]

landfills
Use Disturbances [C1]

Land management [C2X1]
BT Management [C2X]
RT Agriculture [F1]
Forestry [F3]

Landscape architecture [C2W1]
UF naturescaping
BT Design [C2W]
RT Management [C2X]
Planning [C2V]
Sustainability [F8]

landscape change
Use Landscapes [A1]

landscape flows
Use Landscapes [A1]

landscape fragmentation
Use Fragmentation [D5M]

Landscapes [A1]
SN Refers to a set of linked ecosystems within a geographical area.
UF landscape change
landscape flows
NT Human-dominated landscapes [A1M]
RT Biocultural restoration [C2P1]
Biotic communities [B1]
Connectivity [D3]
Ecosystems [A3]
Fragmentation [D5M]
Habitats [A4]
Islands [A3N5]
Populations [A5]

leaching
Use Water [B2M]

legislation
Use Public policy [F7]

Lentic ecosystems [A3M1A]
SN Refers to bodies of still or standing freshwater. Use for aquatic lentic ecosystems; for wetland lentic ecosystems use **Wetland ecosystems [A3O]**
UF lakes
ponds

BT Freshwater ecosystems [A3M1]
RT Water [B2M]
Watersheds [A2]
Wetland ecosystems [A3O]

littoral zones
Use Marine ecosystems [A3M2]

live staking
Use Propagation [C2S]

Local Ecological Knowledge
Use Traditional Ecological Knowledge [F9]

logging
Use Disturbances [C1]

Lotic ecosystems [A3M1B]
SN Refers to bodies of flowing freshwater. Use for aquatic lotic ecosystems; for wetland lotic ecosystems use **Wetland ecosystems [A3O]**
UF floodplains
riparian zones
rivers
springs
streams
BT Freshwater ecosystems [A3M1]
RT Flooding [C1P]
Wetland ecosystems [A3O]
Water [B2M]
Watersheds [A2]

maintenance
Use Management [C2X]

Management [C2X]
SN Use for ongoing monitoring and interventions towards a purpose. For *control* concepts, may be used with the object to be controlled, e.g. **Fire [C1O]** + **Management [C2X].**
UF control
maintenance
regulation
BT Interventions [C2]
NT Adaptive management [C2X2]
Integrated management [C2X3]
Land management [C2X1]
RT Assessment [C2U]
Balance [D1]
Biocultural restoration [C2P1]
Ecosystem services [C3]
Extirpation [C2T]
Fire [C1O]
Indigenous peoples [F5]
Landscape architecture [C2W1]
Metrics [C2U1]
Succession [E7]
Sustainability [F8]

managed relocation
Use Assisted migration [C2R]
mangroves
Use Wetland ecosystems [A3O]
Marine ecosystems [A3M2]
UF intertidal zones
littoral zones
BT Aquatic ecosystems [A3M]
NT Reefs [A3M2A]
RT Estuaries [A3M3]
Fisheries [F2]
Islands [A3N5]
Pollution [B2O]
Temperature [B2Q]
Terrestrial ecosystems [A3N]
Water [B2M]
Wetland ecosystems [A3O]
marshes
Use Wetland ecosystems [A3O]
megafauna
Use Animals [B1M]
meliorative restoration
Use Reclamation [C2O1]
metapopulations
Use Populations [A5]
Metrics [C2U1]
SN Use for quantitative data and for measurement methods.
BT Assessment [C2U]
RT Critical thresholds [D4]
Ecosystem valuation [C4]
Management [C2X]
Planning [C2V]
Microbes [B1O]
UF bacteria
pathogens
BT Biotic communities [B1]
RT Disease [C1R]
Soils [B2N]
micronutrients
Use Nutrients [B2P]
Migration [E4]
SN Use for the cyclical movement of organisms across distances and for the permanent movement of organisms from one environment to another.
UF colonization
translocation
RT Climate change [C1N]
Genetics [E3]
Habitats [A4]

Species [A5M]
Tundra [A3N6]

mining
Use Disturbances [C1]

mires
Use Wetland ecosystems [A3O]

Mitigation [C2M1]
SN Use for interventions intended to offset or counter known or anticipated degradation.
BT Conservation [C2M]
RT Public policy [F7]
Degradation [D5]

monitoring
Use Assessment [C2U]

mulch
Use Soils [B2N]

mutualism
Use Species interactions [E6]

mycorrhizae
Use Fungi [B1N]

Native Americans
Use Indigenous peoples [F5]

Native species [A5M4]
UF endemic species
indigenous species
BT Species [A5M]
RT Animals [B1M]
Invasive species [A5M3]
Keystone species [A5M2]
Non-native species [A5M5]
Species interactions [E6]

naturescaping
Use Landscape architecture [C2W1]

natural capital
Use Ecosystem valuation [C4]

natural disturbances
Use Disturbances [C1]

natural regeneration
Use Passive restoration [C2P2]

natural resources
Use Ecosystem valuation [C4]

Natural selection [E5]
UF adaptation
evolution
evolutionary pressure
RT Genetics [E3]

natural systems
Use Ecosystems [A3]

niches

Use Species [A5M]

nitrogen

Use Nutrients [B2P]

Non-native species [A5M5]

UF alien species
exotic species
foreign species

BT Species [A5M]

RT Animals [B1M]
Invasive species [A5M3]
Native species [A5M4]
Species interactions [E6]

noxious weeds

Use Invasive species [A5M3]

Nutrients [B2P]

UF micronutrients
nitrogen

BT Abiotic factors [B2]

RT Balance [D1]
Cycling [E1]
External exchanges [E2]
Soils [B2N]

nutrient cycling

Use Cycling [E1]

Outreach programs [F6]

UF ecotourism
public support

RT Funding [F4]
Public policy [F7]

Overexploitation [C1M]

SN Refers to depletion of natural resources as they are taken and used by humans.

UF overfishing

BT Disturbances [C1]

RT Agriculture [F1]
Fisheries [F2]
Forestry [F3]

overfishing

Use Overexploitation [C1M]

oxygen production

Use Ecosystem services [C3]

oxygenation

Use Interventions [C2]

Passive restoration [C2P2]

SN Refers to the practice of allowing a degraded ecosystem or disturbed area to recover with minimal active intervention.

UF assisted regeneration
natural regeneration

BT Restoration [C2P]

RT Resilience [D7]

pathogens

Use Microbes [B1O]

parasitism

Use Species interactions [E6]

peatlands

Use Wetland ecosystems [A3O]

performance measures

Use Assessment [C2U]

perturbation

Use Disturbances [C1]

Planning [C2V]

UF civil engineering

BT Interventions [C2]

RT Adaptive management [C2X2]
Assessment [C2U]
Design [C2W]
Funding [F4]
Keystone species [A5M2]
Landscape architecture [C2W1]
Metrics [C2U1]
Public policy [F7]
Succession [E7]

planting

Use Plants [B1P]

Plants [B1P]

SN Use for works that principally concern members of the plant kingdom. For plant populations, use **Plants** + **Populations [A5]**. For particular plant species and for the roles or characteristics of species within an ecosystem, use **Plants** + **Species [A5M]** terms or **Species Interactions [E6]**. For plants as characteristic of certain ecosystems, use the appropriate ecosystem terms. For interventions related to plants, use the appropriate intervention terms.

UF flora
planting
revegetation
trees
vegetation

BT Biotic communities [B1]

NT Seeds [B1P1]

RT Agriculture [F1]
Cycling [E1]
Erosion [C1Q]
Forestry [F3]
Fungi [B1N]
Interventions [C2]
Pollination [C3M]
Populations [A5]
Propagation [C2S]

Species [A5M]
Species Interactions [E6]
Succession [E7]

politics
Use Public policy [F7]

Pollination [C3M]
UF Pollinators
BT Ecosystem services [C3]
RT Animals [B1M]
Plants [B1P]
Propagation [C2S]

pollinators
Use Pollination [C3M]

Pollution [B2O]
UF acid rain
air pollution
gas emissions
waste disposal
BT Abiotic factors [B2]
RT Agriculture [F1]
Disease [C1R]
Disturbances [C1]
Groundwater [B2M1]
Human-dominated landscapes [A1M]
Marine ecosystems [A3M2]
Public policy [F7]
Remediation [C2N]
Soils [B2N]
Temperature [B2Q]
Toxins [B2R]
Urban ecosystems [A3P]
Water [B2M]

ponds
Use Lentic ecosystems [A3M1A]

population fragmentation
Use Fragmentation [D5M]

Populations [A5]
UF metapopulations
recruitment
NT Species [A5M]
RT Animals [B1M]
Ecosystems [A3]
Genetics [E3]
Habitats [A4]
Landscapes [A1]
Plants [B1P]

Prairies [A3N4A]
BT Grasslands [A3N4]

RT Ecosystems [A3]
Terrestrial ecosystems [A3N]

precipitation
Use Water [B2M]

predation
Use Species interactions [E6]

prescribed burns
Use Fire [C1O]

primary consumers
Use Species interactions [E6]

Propagation [C2S]
SN Use for the breeding or asexual reproduction of plants or animals for the purpose of conservative or restorative interventions, and for concepts related to reproduction and population increase.
UF establishment
live staking
propagules
BT Interventions [C2]
RT Animals [B1M]
Plants [B1P]
Pollination [C3M]
Seeds [B1P1]
Soils [B2N]

propagules
Use Propagation [C2S]

proxy species
Use Keystone species [A5M2]

Public policy [F7]
UF government regulations
legislation
politics
RT Agriculture [F1]
Conservation [C2M]
Ecosystem valuation [C4]
Funding [F4]
Human-dominated landscapes [A1M]
Indigenous peoples [F5]
Interventions [C2]
Mitigation [C2M1]
Outreach programs [F6]
Planning [C2V]
Pollution [B2O]
Urban ecosystems [A3P]
Watersheds [A2]

public support
Use Outreach programs [F6]

Reclamation [C2O1]

SN Use for interventions intended to make degraded land fit for cultivation or other human use.
UF meliorative restoration
BT Rehabilitation [C2O]
RT Agriculture [F1]
Remediation [C2N]

recovery
Use Rehabilitation [C2O]

recreation
Use Ecosystem services [C3]

recruitment
Use Populations [A5]

Reefs [A3M2A]
BT Marine ecosystems [A3M2]
RT Islands [A3N5]

reestablishment
Use Rehabilitation [C2O]

reforestation
Use Restoration [C2P]

regulation
Use Management [C2X]

Rehabilitation [C2O]
SN Use for interventions intended to improve degraded ecosystem functioning for the purpose of sustaining ecosystem services, rather than the integrity or biodiversity of the ecosystem.
UF recovery
reestablishment
BT Interventions [C2]
NT Reclamation [C2O1]
RT Ecosystem services [C3]

Remediation [C2N]
SN Use for interventions intended to remove sources of degradation, i.e. the removal or detoxification of contaminants.
BT Interventions [C2]
RT Groundwater [B2M1]
Pollution [B2O]
Reclamation [C2O1]
Soils [B2N]
Toxins [B2R]
Water [B2M]

replenishment
Use Augmentation [C2Q]

Resilience [D7]
UF ecosystem counteractive capacity
social-ecological resilience
weed resistance
RT Assessment [C2U]
Passive restoration [C2P2]

restocking
Use Augmentation [C2Q]

Restoration [C2P]
SN Use for interventions aimed at creating or recreating as nearly as possible a complex, fully-functioning natural ecosystem. For restoration activities specific to an ecosystem type, use both terms; e.g. for afforestation, use **Restoration [C2P]** + **Forests [A3N3]**.
UF afforestation
ecocentric restoration
reforestation
rewilding
BT Interventions [C2]
NT Biocultural restoration [C2P1]
Passive restoration [C2P2]
RT Forests [A3N3]
Wetland ecosystems [A3O]

revegetation
Use Plants [B1P]

rewilding
Use Restoration [C2P]

riparian zones
Use Lotic ecosystems [A3M1B]

rivers
Use Lotic ecosystems [A3M1B]

rituals
Use Traditional Ecological Knowledge [F9]

rocks
Use Abiotic factors [B2]

runoff
Use Water [B2M]

saline lakes
Use Aquatic ecosystems [A3M]

salt marshes
Use Wetland ecosystems [A3O]

secondary consumers
Use Species interactions [E6]

seeding
Use Seeds [B1P1]

Seeds [B1P1]
UF germination
seeding
stratification
BT Plants [B1P]
RT Agriculture [F1]
Propagation [C2S]
Soils [B2N]
Terrestrial ecosystems [A3N]

shading
Use Temperature [B2Q]

shrublands
Use Terrestrial ecosystems [A3N]
siltation
Use Degradation [D5]
social-ecological resilience
Use Resilience [D7]
social-ecological systems
Use Biocultural restoration [C2P1]
Soils [B2N]
UF cover crops
mulch
soil enrichment
soil fertility
soil formation
BT Abiotic factors [B2]
RT Assessment [C2U]
Cycling [E1]
Erosion [C1Q]
Fungi [B1N]
Microbes [B1O]
Nutrients [B2P]
Pollution [B2O]
Propagation [C2S]
Remediation [C2N]
Seeds [B1P1]
Terrestrial ecosystems [A3N]
Toxins [B2R]
soil conservation
Use Ecosystem services [C3]
soil enrichment
Use Soils [B2N]
soil fertility
Use Soils [B2N]
soil formation
Use Soils [B2N]
solar heat
Use Temperature [B2Q]
Species [A5M]
UF ecotypes
guilds
niches
BT Populations [A5]
NT Endangered species [A5M1]
Invasive species [A5M3]
Keystone species [A5M2]
Native species [A5M4]
Non-native species [A5M5]
RT Animals [B1M]

Balance [D1]
Biodiversity [D2]
Extinction [D6]
Extirpation [C2T]
Genetics [E3]
Habitats [A4]
Migration [E4]
Plants [B1P]
Succession [E7]

species diversity
Use Biodiversity [D2]

Species interactions [E6]
UF apex predators
commensalism
companion planting
competition
interplanting
mutualism
parasitism
predation
primary consumers
secondary consumers
symbiosis
tertiary consumers
trophic levels
RT Animals [B1M]
Balance [D1]
Disturbances [C1]
Invasive species [A5M3]
Keystone species [A5M2]
Native species [A5M4]
Non-native species [A5M5]
Plants [B1P]
Succession [E7]

springs
Use Lotic ecosystems [A3M1B]

stewardship
Use Sustainability [F8]

stormwater
Use Water [B2M]

stratification
Use Seeds [B1P1]

streams
Use Lotic ecosystems [A3M1B]

stress
Use Disturbances [C1]

Succession [E7]
UF compositional change

RT Animals [B1M]
Balance [D1]
Biotic communities [B1]
Disturbances [C1]
Fire [C1O]
Flooding [C1P]
Habitats [A4]
Management [C2X]
Planning [C2V]
Plants [B1P]
Species [A5M]
Species interactions [E6]

surrogate species
Use Keystone species [A5M2]

Sustainability [F8]
UF stewardship
sustainable development
RT Agriculture [F1]
Biocultural restoration [C2P1]
Conservation [C2M]
Fisheries [F2]
Forestry [F3]
Human-dominated landscapes [A1M]
Indigenous peoples [F5]
Integrated management [C2X3]
Landscape architecture [C2W1]
Management [C2X]
Traditional Ecological Knowledge [F9]

sustainable development
Use Sustainability [F8]

swamps
Use Wetland ecosystems [A3O]

symbiosis
Use Species interactions [E6]

Temperature [B2Q]
UF heat
shading
solar heat
BT Abiotic factors [B2]
RT Climate change [C1N]
Deserts [A3N2]
Marine ecosystems [A3M2]
Pollution [B2O]
Water [B2M]

Terrestrial ecosystems [A3N]
SN Use for ecosystems in which land is dominant over water.
UF heathlands
shrublands

BT Ecosystems [A3]
NT Alpine ecosystems [A3N1]
Deserts [A3N2]
Forests [A3N3]
Grasslands [A3N4]
Islands [A3N5]
Tundra [A3N6]
RT Marine ecosystems [A3M2]
Prairies [A3N4A]
Seeds [B1P1]
Soils [B2N]

tertiary consumers
Use Species interactions [E6]

testing
Use Assessment [C2U]

threatened species
Use Endangered species [A5M1]

threshold of irreversibility
Use Critical thresholds [D4]

Toxins [B2R]
BT Abiotic factors [B2]
RT Disease [C1R]
Groundwater [B2M1]
Pollution [B2O]
Remediation [C2N]
Soils [B2N]

Traditional Ecological Knowledge [F9]
UF Local Ecological Knowledge
rituals
RT Biocultural restoration [C2P1]
Indigenous peoples [F5]
Sustainability [F8]

translocation
Use Migration [E4]

trees
Use Plants [B1P]

trophic levels
Use Species interactions [E6]

Tropical rainforests [A3N3A]
BT Forests [A3N3]
RT Agriculture [F1]
Fire [C1O]

Tundra [A3N6]
BT Terrestrial ecosystems [A3N]
RT Climate change [C1N]
Migration [E4]

Urban ecosystems [A3P]

BT Ecosystems [A3]
RT Design [C2W]
Human-dominated landscapes [A1M]
Pollution [B2O]
Public policy [F7]

urban ecosystem services
Use Ecosystem services [C3]

urbanization
Use Human-dominated landscapes [A1M]

vegetation
Use Plants [B1P]

vernal pools
Use Wetland ecosystems [A3O]

waste disposal
Use Pollution [B2O]

Water [B2M]
UF irrigation
leaching
precipitation
runoff
stormwater
BT Abiotic factors [B2]
NT Groundwater [B2M1]
RT Aquatic ecosystems [A3M]
Assessment [C2U]
Deserts [A3N2]
Erosion [C1Q]
Estuaries [A3M3]
Fisheries [F2]
Freshwater ecosystems [A3M1]
Lentic ecosystems [A3M1A]
Lotic ecosystems [A3M1B]
Marine ecosystems [A3M2]
Pollution [B2O]
Remediation [C2N]
Temperature [B2Q]
Wetland ecosystems [A3O]

Watersheds [A2]
RT Flooding [C1P]
Freshwater ecosystems [A3M1]
Groundwater [B2M1]
Lentic ecosystems [A3M1A]
Lotic ecosystems [A3M1B]
Public policy [F7]
Wetland ecosystems [A3O]

weed resistance
Use Resilience [D7]

weeds

Use Invasive species [A5M3]

Wetland ecosystems [A3O]

SN Use for ecosystems dominated neither by land nor by water.
UF bogs
mangroves
marshes
mires
peatlands
salt marshes
swamps
vernal pools
BT Ecosystems [A3]
RT Aquatic ecosystems [A3M]
Estuaries [A3M3]
Freshwater ecosystems [A3M1]
Lentic ecosystems [A3M1A]
Lotic ecosystems [A3M1B]
Marine ecosystems [A3M2]
Restoration [C2P]
Water [B2M]
Watersheds [A2]

wilderness

Use Habitats [A4]

wildlife

Use Animals [B1M]

wind

Use Abiotic factors [B2]

woodlands

Use Forests [A3N3]

3.0 Classified Schedule

[A] <Whole or complex ecological entities>

- **[A1] Landscapes**
  - [A1M] Human-dominated landscapes
- **[A2] Watersheds**
- **[A3] Ecosystems**
  - [A3M] Aquatic ecosystems
    - [A3M1] Freshwater ecosystems
      - [A3M1A] Lentic ecosystems
      - [A3M1B] Lotic ecosystems
    - [A3M2] Marine ecosystems
      - [A3M2A] Reefs
    - [A3M3] Estuaries
  - [A3N] Terrestrial ecosystems
    - [A3N1] Alpine ecosystems
    - [A3N2] Deserts
    - [A3N3] Forests
      - [A3N3A] Tropical rainforests
    - [A3N4] Grasslands
      - [A3N4A] Prairies
    - [A3N5] Islands
    - [A3N6] Tundra
  - [A3O] Wetland ecosystems
  - [A3P] Urban ecosystems
- **[A4] Habitats**
- **[A5] Populations**
  - [A5M] Species
    - [A5M1] Endangered species
    - [A5M2] Keystone species
    - [A5M3] Invasive species
    - [A5M4] Native species
    - [A5M5] Non-native species

[B] <Parts or components of ecosystems>

- **[B1] Biotic communities**
  - [B1M] Animals
  - [B1N] Fungi
  - [B1O] Microbes
  - [B1P] Plants
    - [B1P1] Seeds
- **[B2] Abiotic factors**
  - [B2M] Water
    - [B2M1] Groundwater

[B2N] Soils
[B2O] Pollution
[B2P] Nutrients
[B2Q] Temperature
[B2R] Toxins

[C] <Operations on ecosystems OR in restoration>

[C1] Disturbances
[C1M] Overexploitation
[C1N] Climate change
[C1O] Fire
[C1P] Flooding
[C1Q] Erosion
[C1R] Disease

[C2] Interventions [C2]
[C2M] Conservation
[C2M1] Mitigation
[C2N] Remediation
[C2O] Rehabilitation
[C2O1] Reclamation
[C2P] Restoration
[C2P1] Biocultural restoration
[C2P2] Passive restoration
[C2Q] Augmentation
[C2R] Assisted migration
[C2S] Propagation
[C2T] Extirpation
[C2U] Assessment
[C2U1] Metrics
[C2V] Planning
[C2W] Design
[C2W1] Landscape architecture
[C2X] Management
[C2X1] Land management
[C2X2] Adaptive management
[C2X3] Integrated management

[C3] Ecosystem services
[C3M] Pollination

[C4] Ecosystem valuation

[D] <Attributes of complex entities>

[D1] Balance
[D2] Biodiversity
[D3] Connectivity
[D4] Critical thresholds
[D5] Degradation

[D5M] Fragmentation

[D6] Extinction

[D7] Resilience

[E] <Processes and ecosystem functions>

[E1] Cycling

[E2] External exchanges

[E3] Genetics

[E4] Migration

[E5] Natural selection

[E6] Species interactions

[E7] Succession

[F] <Agents, products, and organizations>

[F1] Agriculture

[F2] Fisheries

[F3] Forestry

[F4] Funding

[F5] Indigenous peoples

[F6] Outreach programs

[F7] Public policy

[F8] Sustainability

[F9] Traditional Ecological Knowledge

4.0 Named Geographic Entity List

Africa

SN Refers to the geographic areas contained within the geopolitical region of Africa as per the United Nations Statistical Division, thus including the African continent and affiliated islands such as Mauritius, Seychelles, and Madagascar. The term is selected for authority and scoped per the UNSD's *Standard Geographic Regions.*

UF African continent
North Africa
Sub-Saharan Africa

Antarctica

SN Refers to the geographic areas contained within the geopolitical region of Antarctica as per the United Nations Statistical Division, thus including the Antarctic continent and affiliated islands. The term is selected for authority and scoped per the UNSD's *Standard Geographic Regions.*

UF Antarctic continent

Arctic Ocean

SN Refers to the hydrogeographic area contained within the Arctic ocean basin, including the Arctic ice pack, and to the ocean's marginal bodies of water, such as the Laptev Sea, Hudson Bay, and Baffin Bay. The term is selected for authority and scoped as stated per the International Hydrographic Organization's 4th edition (2002) of its *Limits of Oceans and Seas.*

UF Arctic ice pack
Arctic ice cap
The Arctic

Atlantic Ocean

SN Refers to the hydrogeographic area contained within the Atlantic ocean basin and to the ocean's marginal bodies of water, such as the Gulf of Mexico, the Caribbean Sea, and the Mediterranean Sea. The term is selected for authority and scoped as stated per the International Hydrographic Organization's 4th edition (2002) of its *Limits of Oceans and Seas.*

UF North Atlantic Ocean
South Atlantic Ocean
The Atlantic

Asia

SN Refers to the geographic areas contained within the geopolitical region of Asia as per the

United Nations Statistical Division, thus including portions of the Eurasian continent and affiliated islands such as Indonesia, the Philippines, and Japan. The term is selected for authority and scoped per the UNSD's *Standard Geographic Regions.*

UF Eurasian continent
Indian subcontinent

Middle East

Central America and the Caribbean

SN Refers to the geographic areas contained within the geopolitical regions of Central America and the Caribbean as per the United Nations Statistical Division, thus including the Central American subcontinent, Mexico, and all Caribbean islands. The term is selected for authority and scoped per the UNSD's *Standard Geographic Regions.*

UF Americas
Caribbean islands
Central America

Europe

SN Refers to the geographic areas contained within the geopolitical region of Europe as per the United Nations Statistical Division, thus including portions of the Eurasian continent and affiliated islands such as Iceland, Crete, and the Anglo-Celtic Isles. The term is selected for authority and scoped per the UNSD's *Standard Geographic Regions.*

UF Eurasian continent

Indian Ocean

SN Refers to the hydrogeographic area contained within the Indian ocean basin and to the ocean's marginal bodies of water, such as the Red Sea and the Persian Gulf. The term is selected for authority and scoped as stated per the International Hydrographic Organization's 4th edition (2002) of its *Limits of Oceans and Seas.*

UF Afrasian Sea
Asian Sea

Northern America

SN Refers to the geographic areas contained within the geopolitical region of Northern America as per the United Nations Statistical Division, thus including portions of the Americas (the United States and Canada) and affiliated islands such as Bermuda and Greenland. The term is selected for authority and scoped per the UNSD's *Standard Geographic Regions.*

UF Americas
North America
North American continent

Oceania

SN Refers to the geographic areas contained within the geopolitical region of Oceania as per

the United Nations Statistical Division, thus including the Australian continent, New Zealand, Polynesia, Micronesia and Melanesia. The term is selected for authority and scoped per the UNSD's *Standard Geographic Regions.*

UF Australasia
Melanesia
Micronesia
Polynesia

Pacific Ocean

SN Refers to the hydrogeographic area contained within the Pacific ocean basin and to the ocean's marginal bodies of water, such as the South China Sea, the Sea of Japan, and the Coral Sea. The term is selected for authority and scoped as stated per the International Hydrographic Organization's 4th edition (2002) of its *Limits of Oceans and Seas.*

UF North Pacific Ocean
South Pacific Ocean
The Pacific

South America

SN Refers to the geographic areas contained within the geopolitical region of South America
as per the United Nations Statistical Division, thus including portions of the Americas (the total area south of the Central American subcontinent) and affiliated islands such as the Chiloé archipelago and the Galapagos Islands. The term is selected for authority and scoped per the UNSD's *Standard Geographic Regions.*

UF Americas
South American continent
Southern America

Southern Ocean

SN Refers to the hydrogeographic area contained within the Southern ocean basin and to the ocean's marginal bodies of water, such as the Scotia Sea and the Ross Sea. The term is selected for authority and scoped as stated per the International Hydrographic Organization's 4th edition (2002) of its *Limits of Oceans and Seas.*

UF Antarctic Ocean
Austral Ocean

5.0 Appendices

5.1.0 Appendix A - Bibliography

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