

APPENDICES

APPENDIX A: NatureServe Conservation Status Definitions

The global (G) conservation status (rank) of a species or ecological community is assigned by NatureServe based on the *range-wide* status of that species or ecological community. The rank is regularly reviewed and updated by experts, and takes into account such factors as number and quality/condition of occurrences, population size, range of distribution, population trends, protection status, and fragility. The definitions of these ranks, which are not to be interpreted as legal designations, are as follows:

Global Conservation Status Ranks

GX Presumed Extinct (species): Not located despite intensive searches and virtually no likelihood of rediscovery

Extinct (ecological communities and systems): Eliminated throughout its range, with no restoration potential.

GH Possibly Extinct: Known only from historical occurrences but still some hope of rediscovery

G1 Critically Imperiled: At very high risk of extinction or elimination due to extreme rarity, very steep declines, or other factors.

G2 Imperiled: At high risk of extinction or elimination due to very restricted range, very few populations or occurrences, steep declines, or other factors.

G3 Vulnerable: At moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors.

G4 Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5 Secure: Common; widespread and abundant.

G(#)T(#) Trinomial (T) rank applies to subspecies or varieties; these taxa are T-ranked using the same definitions as the G-ranks above.

Variant Global Status Ranks

G#G# Range Rank: A numeric range rank (e.g., G2G3) is used to indicate uncertainty about the exact status of a species or community. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).

GU Unrankable: Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. NOTE: Whenever possible (when the range of uncertainty is three consecutive

ranks or less), a range rank (e.g., G2G3) should be used to delineate the limits (range) of uncertainty.

GNR Unranked: Global rank not yet assessed.

GNA Not Applicable: A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities (e.g., a hybrid without conservation value, of domestic origin, an agricultural field).

Rank Qualifiers

? Inexact Numeric Rank: Denotes inexact numeric rank.

Q Questionable taxonomy that may reduce conservation priority:

Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon/type having a lower-priority (numerically higher) conservation status rank.

C Captive or Cultivated: Taxon at present is extinct in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population not yet established.

APPENDIX B: Element Occurrence Ranks

Basic EO Ranks

Rank	Definition
A	<p>Excellent estimated viability (species) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is believed to have an excellent probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years.</p> <p>Excellent ecological integrity (communities) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is believed to have an excellent probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years (within the bounds of natural disturbance regimes).</p>
B	<p>Good estimated viability (species) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is believed to have a good probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years.</p> <p>Good ecological integrity (communities) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is believed to have a good probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years (within the bounds of natural disturbance regimes).</p>
C	<p>Fair estimated viability (species) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is believed to have a fair probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years.</p> <p>Fair ecological integrity (communities) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is believed to have a fair probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years (within the bounds of natural disturbance regimes).</p>
D	<p>Poor estimated viability (species) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is believed to have a poor probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years.</p> <p>Poor ecological integrity (communities) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is believed to have a poor probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years (within the bounds of natural disturbance regimes).</p>
E	<p>Verified Extant (species) – EO has been recently verified as still existing, but sufficient information on the factors used to estimate viability of the occurrence has not yet been obtained.</p> <p>Verified Extant (communities) – EO has been recently verified as still existing, but sufficient information on the factors used to estimate ecological integrity of the occurrence has not yet been obtained.</p> <p>Use of the E rank should be reserved for those situations where the occurrence is thought to be extant, but an A, B, C, D, or range rank (see table below) cannot be assigned.</p>
H	<p>Historical (species) – There is a lack of recent² field information verifying the continued existence of the EO, such as when the occurrence is based only on historical collections data, or when the occurrence was ranked A, B, C, D, or E at one time and is later, without field survey work, considered to be possibly extirpated due to general habitat loss or degradation of the environment in the area.</p> <p>Historical (communities) – There is a lack of recent² field information verifying the continued existence of the EO, such as when the occurrence was ranked A, B, C, D, or E at one time and is later, without field survey work, considered to be possibly extirpated due to general habitat loss or degradation of the environment in the area.</p>
F	<p>Failed to find – EO has not been found despite a search by an experienced observer at a time and under conditions appropriate for the Element at a location where it was previously reported, but that still might be confirmed to exist at that location with additional field survey efforts. For EOs with vague locational information, the search must include areas of appropriate habitat within the range of locational uncertainty³.</p> <p>An F rank, when applicable, supersedes an A, B, C, D, E, or H rank.</p>
X	<p>Extirpated – There is documented destruction of the habitat or environment of the EO, or persuasive evidence of its eradication based on adequate survey (i.e., thorough or repeated survey efforts by one or more experienced observers at times and under conditions appropriate for the Element at that location).</p>
U	<p>Unrankable – An EO rank cannot be assigned due to lack of sufficient information on the occurrence.</p>
NR	<p>Not Ranked – An EO rank has not yet been assigned to the occurrence.</p>

EO Rank Qualifier

Rank	Definition
?	Inexact basic EO rank or origin subrank – There is uncertainty distributed about the basic rank or origin subrank assigned to the EO.

EO Range Ranks

Rank	Definition
AB	<p>Excellent to good estimated viability (species) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is deemed to have at least a good probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years. This range rank is assigned when further information indicating the degree of viability (i.e., A or B differentiation) is lacking.</p> <p>Excellent to good ecological integrity (communities) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is deemed to have at least a good probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years (within the bounds of natural disturbance regimes). This range rank is assigned when further information indicating the degree of ecological integrity (i.e., A or B differentiation) is lacking.</p>
AC	<p>Excellent to fair estimated viability (species) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is deemed to have at least a fair probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years. This range rank is assigned when further information indicating the degree of viability (i.e., A, B, or C differentiation) is lacking.</p> <p>Excellent to fair ecological integrity (communities) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is deemed to have at least a fair probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years (within the bounds of natural disturbance regimes). This range rank is assigned when further information indicating the degree of ecological integrity (i.e., A, B, or C differentiation) is lacking.</p>
BC	<p>Good to fair estimated viability (species) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is deemed to have a good to fair probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years. This range rank is assigned when further information indicating the degree of viability (i.e., B or C differentiation) is lacking.</p> <p>Good to fair ecological integrity (communities) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is deemed to have a good to fair probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years (within the bounds of natural disturbance regimes). This range rank is assigned when further information indicating the degree of ecological integrity (i.e., B or C differentiation) is lacking.</p>
BD	<p>Good to poor estimated viability (species) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is deemed to have a good to poor probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years. This range rank is assigned when further information indicating the degree of viability (i.e., B, C, or D differentiation) is lacking.</p> <p>Good to poor ecological integrity (communities) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is deemed to have a good to poor probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years (within the bounds of natural disturbance regimes). This range rank is assigned when further information indicating the degree of ecological integrity (i.e., B, C, or D differentiation) is lacking.</p>
CD	<p>Fair to poor estimated viability (species) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is deemed to have a fair to poor probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years. This range rank is assigned when further information indicating the degree of viability (i.e., C or D differentiation) is lacking.</p> <p>Fair to poor ecological integrity (communities) – Based on current information on EO rank factors¹ (i.e., condition, size, and landscape context) for the EO, it is deemed to have a fair to poor probability of persisting, if current conditions prevail, for a defined period of time, typically 20-100 years (within the bounds of natural disturbance regimes). This range rank is assigned when further information indicating the degree of ecological integrity (i.e., C or D differentiation) is lacking.</p>

Origin Subranks

Rank	Definition
i	Introduced – Used to indicate that the EO resulted from the introduction of the Element to areas outside of the presently or historically occupied portions of its native range. EOs that are assigned an origin status subrank of i are neither native nor natural in origin.
r	<p>Reintroduced (species) – Used to indicate that all or a majority of the individuals in the EO have been anthropogenically translocated to that location, which must be within a presently or historically occupied portion of the native range of the Element. A reintroduction could include a transplant from elsewhere; it could also include a transplant of some or all of the individuals in an EO to a location within the separation distance surrounding the original occurrence. In such situations, the r subrank should be used for the occurrence when greater than 50% of the population has been reintroduced. Removing individuals and returning them and/or their progeny to the original location does not constitute a restoration.</p> <p>Used to indicate the EO is retained over time unless there is evidence of significant gene flow from naturally dispersing individuals into that occurrence. Similarly, a new EO thought to be established directly or indirectly through dispersal of individuals from a reintroduced occurrence should also be treated as a reintroduced occurrence unless there is evidence of significant gene flow from other individuals dispersing from natural populations into that EO.</p> <p>Reintroduced (communities) – Used for rare community EOs that have been re-established in areas where they are believed to have previously existed (i.e., de novo restorations).</p> <p>Both species and community EOs that are assigned an r origin status subrank are native, but not natural, in origin, having been established by anthropogenic means.</p>

APPENDIX C: Scale-of-Occurrence Classes for Terrestrial Ecological Elements

Scale-of-Occurrence Classes ("Patch Types") for Terrestrial Ecological Systems and Communities.

Geographic Scale (Patch Type)	Definition
Coarse (Matrix-forming)	Communities or systems that form extensive and contiguous cover, occur on the most extensive landforms, and typically have wide ecological tolerances. Disturbance patches typically occupy a relatively small percentage (e.g. <5%) of the total occurrence. In undisturbed conditions, typical occurrences range in size from 2,000 to 100,000 ha.
Intermediate (Large Patch)	Communities or systems that form large areas of interrupted cover and typically have narrower ranges of ecological tolerances than matrix types. Individual disturbance events tend to occupy patches that can encompass a large proportion of the overall occurrence (e.g. >20%). In undisturbed conditions, typical occurrences range from 50-2,000 ha.
Intermediate (Linear)	Communities or systems that occur as linear strips and are often ecotonal between terrestrial and aquatic ecosystems. In undisturbed conditions, typical occurrences range in linear distance from 0.5 to 100 km.
Local (Small Patch)	Communities or systems that form small, discrete areas of vegetation cover typically limited in distribution by localized

	environmental features. In undisturbed conditions, typical occurrences range from 1-50 ha.
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APPENDIX D: Land Use Intent Categories

NatureServe Vista includes a mechanism that facilitates the merger of land use data into one common classification. This allows the user to incorporate multiple land uses and “crosswalk” them to a common land use classification. While the common land use classification can be customized, the *IUCN-CMP Unified Classifications of Direct Threats* are included with this package. The *Unified Classifications* are a standardized classification of anthropogenic activities or processes which currently or could potentially damage species, natural communities or ecosystems (IUCN-CMP 2006). See http://conservationmeasures.org/CMP/IUCN/Site_Page.cfm for more information.

Land use data often originates from various sources. An important step is assimilating the data into a common land use classification. Characterizing the diverse land use types by their potential effects will simplify the overall analysis, sometimes dissimilar layers into new categories. In doing so, planning team members will need to assess each land use in terms of its impacts to the environment and grouping land uses in terms of their *destruction, degradation and/or impairment of biodiversity and natural processes*. (IUCN-CMP 2006). Good classifications are simple and intuitive; an audience of professionals should be able to clearly understand how and why certain layers were grouped together. A consistent approach to classifying will aid this process immensely. The classification should allow new land use layers to be incorporated as they are identified or changed depending on expert input. As we mentioned above, the IUCN-CMP Unified Classifications are standard, globalized classifications. You should not be restricted to these classifications if they do not suit your project or will be difficult for the experts and/or stakeholders to understand. Feel free to create your own standard classification that reflects the direct threats to your project and your audience. Split the IUCN-CNP classifications to provide additional detail or create entirely new classes by adding a new row. NatureServe Vista is flexible enough to incorporate customized land use classifications. For example, you may wish to add a second Housing and Urban Areas class to accommodate several densities of housing development.

Classification	Definition
Residential & Commercial Development	Threats from human settlements or other non-agricultural land uses with a substantial footprint
Housing and Urban Areas	Human cities, towns, and settlements including non-housing development typically integrated with housing
Commercial & Industrial Areas	Factories and other commercial

	centers
Tourism & Recreation Areas Development	Tourism and recreation sites with a substantial footprint
Agricultural and Aquaculture	Threats from farming and ranching as a result of agricultural expansion and intensification, including silviculture, mariculture and aquaculture
Annual & Perennial Non-Timber Crops	Crops planted for food, fodder, fiber, fuel, or other uses
Wood & Pulp Plantations	Stands of trees planted for timber or fiber outside of natural forests, often with non-native species
Livestock Farming & Ranching	Domestic terrestrial animals raised in one location on farmed or non-local resources (farming); also domestic or semi-domesticated animals allowed to roam in the wild and supported by natural habitats (ranching)
Marine & Freshwater Aquaculture	Aquatic animals raised in one location on farmed or non-local resources; also hatchery fish allowed to roam in the wild
Energy Production and Mining	Threats from production of non-biological resources
Oil & Gas Drilling	Exploring for, developing, and producing petroleum and other liquid hydrocarbons
Mining & Quarrying	Exploring for, developing, and producing minerals and rocks
Renewable Energy	Exploring, developing, and producing renewable energy
Transportation and Service Corridors	Threats from long narrow transport corridors and the vehicles that use them including associated wildlife mortality
Roads & Railroads	Surface transport on roadways and dedicated tracks
Utility & Service Lines	Transport of energy & resources
Shipping Lanes	Transport on and in freshwater and

	ocean waterways
Flight Paths	Air and space transport
Biological Resource Use	Threats from consumptive use of "wild" biological resources including both deliberate and unintentional harvesting effects; also persecution or control of specific species
Hunting & Collecting Terrestrial Animals	Killing or trapping terrestrial wild animals or animal products for commercial, recreation, subsistence, research or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch
Gathering Terrestrial Plants	Harvesting plants, fungi, and other non-timber/non-animal products for commercial, recreation, subsistence, research or cultural purposes, or for control reasons
Logging & Wood Harvesting	Harvesting trees and other woody vegetation for timber, fiber, or fuel
Fishing & Harvesting Aquatic Resources	Harvesting aquatic wild animals or plants for commercial, recreation, subsistence, research, or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch
Human Intrusions and Disturbance	Threats from human activities that alter, destroy and disturb habitats and species associated with non-consumptive uses of biological resources
Recreation Activities	People spending time in nature or traveling in vehicles outside of established transport corridors, usually for recreational reasons
War, Civil Unrest, and Military Exercises	Actions by formal or paramilitary forces without a permanent footprint
Work and Other Activities	People spending time in or traveling in natural environments for reasons other than recreation, military activities, or research

Natural System Modifications	Threats from actions that convert or degrade habitat in service of “managing” natural or semi-natural systems, often to improve human welfare
Fire & Fire Suppression	Suppression or increase in fire frequency and/or intensity outside of its natural range of variation
Dams & Water Management / Use	Changing water flow patterns from their natural range of variation either deliberately or as a result of other activities
Other Ecosystem Modifications	Other actions that convert or degrade habitat in service of “managing” natural systems to improve human welfare
Invasive and Other Problematic Species and Genes	Threats from non-native and native plants, animals, pathogens/microbes, or genetic materials that have or are predicted to have harmful effects on biodiversity following their introduction, spread and/or increase in abundance
Invasive Non-Native / Alien Species	Harmful plants, animals, pathogens and other microbes not originally found within the ecosystem(s) in question and directly or indirectly introduced and spread into it by human activities
Problematic Native Species	Harmful plants, animals, or pathogens and other microbes that are originally found within the ecosystem(s) in question, but have become “out-of-balance” or “released” directly or indirectly due to human activities
Introduced Genetic Material	Human altered or transported organisms or genes
Pollution	Threats from introduction of exotic and/or excess materials or energy from point and nonpoint sources
Household Sewage & Urban Water	Water-borne sewage and non-point

Waste	runoff from housing and urban areas that include nutrients, toxic chemicals and/or sediments
Industrial & Military Effluents	Water-borne pollutants from industrial and military sources including mining, energy production, and other resource extraction industries that include nutrients, toxic chemicals and/or sediments
Agricultural & Forestry Effluents	Water-borne pollutants from agricultural, silvicultural, and aquaculture systems that include nutrients, toxic chemicals and/or sediments including the effects of these pollutants on the site where they are applied
Garbage & Solid Waste	Rubbish and other solid materials including those that entangle wildlife
Air-Borne Pollutants	Atmospheric pollutants from point and nonpoint sources
Excess Energy	Inputs of heat, sound, or light that disturb wildlife or ecosystems
Geologic Events	Threats from catastrophic geological events
Volcanos	Volcanic events
Earthquakes / Tsunamis	Earthquakes and associated events
Avalanches / Landslides	Avalanches or landslides
Climate Change and Severe Weather	Threats from long-term climatic changes which may be linked to global warming and other severe climatic/weather events that are outside of the natural range of variation, or potentially can wipe out a vulnerable species or habitat
Habitat Shifting & Alteration	Major changes in habitat composition and location
Droughts	Periods in which rainfall falls below the normal range of variation
Temperature Extremes	Periods in which temperatures

	exceed or go below the normal range of variation
Storms & Flooding	Extreme precipitation and/or wind events
Land and Water Protection	Actions to identify, establish or expand parks and other legally protected areas
Site / Area Protection	Establishing or expanding public or private parks, reserves, and other protected areas roughly equivalent to IUCN Categories I-VI
Resource & Habitat Protection	Establishing protection or easements of some specific aspect of the resource on public or private lands outside of IUCN Categories I-VI
Land / Water Management	Actions directed at conserving or restoring sites, habitats and the wider environment
Site / Area Management	Management of protected areas and other resource lands for conservation
Invasive / Problematic Species Control	Controlling and/or preventing invasive and/or other problematic plants, animals, and pathogens
Habitat & Natural Process Restoration	Enhancing degraded or restoring missing habitats and ecosystem functions; dealing with pollution
Species Management	Actions directed at managing or restoring species, focused on the species of concern itself
Species Management	Managing specific plant and animal populations of concern
Species Recovery	Manipulating, enhancing or restoring specific plant and animal populations, vaccination programs
Species Re-Introduction	Re-introducing species to places where they formally occurred or benign introductions
Ex-Situ Conservation	Protecting biodiversity out of its native habitats

Land use intent (LUI) is a hierarchical classification ordered by intensity of land use. The term "land use" applies to any intentional actions on the land including management practices. Intensity is the degree to which land use negatively impacts biological elements through alterations to natural land cover, the presence of anthropogenic structures, and the introduction of people into the landscape (e.g., Crist et al. 2000).

LUI is described by a class name, and has both major and minor classes. Major classes describe general land uses, such as "working landscapes," "development," and "converted." These categories are refined by minor classes that describe the level of land use intensity within the major class, if known. Virtually all zoning plans permit more than one LUI for a tract.

When the minor class within a major cannot be identified, the "Unknown" category under the major class is generally utilized. However, the use of "Unknown" is strongly discouraged at the major class level as it will reduce precision of the results of analyses that utilize LUI. Specifically, if a tract has a major intent class of "Unknown," analyses will utilize a conservative approach, considering it "incompatible" based on the assumption that the land has been converted until proven otherwise.

LUI categories are utilized in Vista to 1) indicate which land uses are compatible with elements individually (assigned on the [Compatibility tab](#) of the [Element Properties window](#)), and 2) cross-walk land use/management types in a planning region to "standard" types (assigned during the process of creating translators using the [Translator Properties wizard](#)). Both of these uses for LUI (assigning compatibility and creating translators) are utilized in [Land Use and Conservation Scenario Evaluations](#). Vista provides the capability for users to customize LUI categories (using the [Edit Land Use Intent window](#)) in order to better capture the important conservation impacts of specific land uses and/or management practices in the planning region.

APPENDIX E: Policy Types

Policy types (PTs) are categories describing the mechanism that guides the implementation of a land use intent (LUI) designation (described in [Appendix F](#)), including processes that prevent or allow land uses of greater intensity. In other words, PT provides an indication of the likelihood that the actual land use will be no more intense than the stated LUI. For example, a "working landscape" area can be permanently designated for this use by land trust easement or by zoning, which is a temporary regulation. In this case, the easement would be considered a reliable PT, that is, it would more reliably enforce the designated land use or prevent a use of greater intensity than the zoning regulation, which can be changed with relative ease.

PT are utilized in Vista to 1) cross-walk policy practices in a planning region to "standard" types (assigned during the process of creating translators using the [Translator Properties wizard](#)), and 2) indicate which policy types are considered to reliably enforce the implementation of a compatible LUI and prevent a use of

greater intensity, which may provide adequate protection for elements (assigned on the [Evaluate Scenario window](#)). Both of these uses for PT (creating translators and assessing validity) are utilized in [Land Use and Conservation Scenario Evaluations](#). Vista provides the capability for users to customize PTs (using the [Edit Policy Type window](#)) in order to better capture the important conservation impacts of specific policy mechanisms in the planning region.

POLICY TYPES

Note that the term "land use" applies to any intentional actions on the land, including management practices.

Legislatively/administratively mandated land use

Type that applies to tracts where the land use has been mandated by a legislative body (e.g., state/provincial government, national legislative body), such as designated "wilderness areas." This type can also include administrative designations that are intended to be permanent (e.g., national monuments). These designations are considered irrevocable during the planning time frame.

Revocable legislatively/administratively mandated land use

Type that applies to tracts where the land use has been mandated by a legislative or administrative body, but the designation may be relatively simple to revoke during the planning time frame.

Statutory enforced land use plan

Type that includes land use plans produced under statutory requirements, which provide strict mechanisms of control and resources for implementation for specified periods of time (e.g., federal land management plans). The breadth of allowable land uses for this type is typically narrow, and the assumption is made that land use will not be more intense than that specified for the planning time frame. However, there are mechanisms to change such plans under certain circumstances.

Institutionally managed easement or holding

Type that includes tracts held and managed by a conservation institution (e.g., land trust, mitigation bank). Examples of this type include fee-simple ownership, purchased and donated easements, and purchased or transferred development rights. Legal arrangements irrevocably remove the rights to develop or utilize the land more intensely than specified by the land use. This policy type requires that the institution actively manage or routinely enforce any easement, and that it has adequate resources to do so during the planning time frame.

Resident managed easement

Type that includes purchased and donated easements, and purchased or transferred development rights, which are held by an institution. Legal arrangements irrevocably remove the rights to develop or utilize the land more intensely than specified by the land use. However, the resident of the property is allowed to manage the easement under this type, and there is a lack of routine enforcement by the institution and/or institutional resources to do so during the planning time frame.

Land use restricted by regulation

Type that includes land use plans and regulations imposed on land owners that differ from those of the regulating body, and typically cover a broad scope of land uses. Variances to the plan or regulation are allowed at any time by petition of land owners or others (e.g., local government zoning board); thus, changing the regulations is a relatively simple process.

Land use restricted by temporary incentive program

Type that includes tracts where the land use is maintained at a less intense level than regulations, if any, allow through the use of payments, tax incentives, or other assistance to the land owner (e.g., U.S. Department of Agriculture Farm Bill incentives). These programs are voluntary, of limited duration, and are relatively simple to revoke. More permanent arrangements under such programs should be described as "easements."

Voluntarily protected

Type that includes tracts where the land owner voluntarily maintains the land in a less intense land use than regulations, if any, allow. The land use is not backed by any incentive payments or easements, and may be changed at any time by the land owner.

Unrestricted from conversion to higher intensity uses

This type is used for all tracts not categorized as any other policy type (including "Unknown"). Regulations (e.g., zoning) or other mechanisms are known to be lacking for these tracts, and/or "by-right" land uses are permitted.

Unknown

Policy type cannot be determined because of inadequate information. Note that assigning the PT category "Unknown" will result in the assumption of "unprotected" in analyses that utilize PT information.

GLOSSARY

- A -

- B -

Biological and Conservation Data system (BCD): Database developed in 1988 by The Nature Conservancy for recording and maintaining information on elements of biodiversity, including locations, viability/ecological integrity, trends, and references.

Biotic communities: Assemblage of populations of species that live in a prescribed area or physical habitat.

Biotics: Application developed by NatureServe for storing and managing information on Elements, Element Occurrences (EOs), Sites, and Managed Areas.

- C -

Communities: (terrestrial and aquatic at least)

Compatibility: An indication whether a specific land use intent (LUI) category (described in [Appendix F](#)) will permit elements to remain *viable* (species) or maintain *ecological integrity* (ecological elements). A LUI that is compatible will allow the continued persistence of an element at locations with that use.

Compatibility map:

Converted area/land: Area that has been changed from its original form or use, typically to agricultural or developed land. For example, an area that was formerly tallgrass prairie but is currently agricultural cropland is a converted area.

- D -

Degradation index:

Distance effect:

- E -

Ecological integrity: The maintenance of structure, species composition, and the rate of ecological processes and functions of an ecological system or community within the bounds of normal disturbance regimes. Occurrences with ecological integrity must meet minimum size requirements defined for the element on the [Element Properties window](#) in Vista.

Ecological systems: Assemblages of biotic communities that occupy similar environments and that function under common ecological processes. Terrestrial ecological systems are typically identified using vegetation structure and composition, but their concepts also include various abiotic

components. Analogous broad-scale units in the aquatic realm, aquatic ecological systems, are based on environmental or physical features that shape key ecosystem processes (hydrology, water chemistry, sediment transport), and that influence the distribution and composition of biological assemblages.

Element Occurrence (EO): An area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location. For species Elements, the EO often corresponds with the local population, but when appropriate may be a portion of a population (e.g., long distance dispersers) or a group of nearby populations (e.g., metapopulation). For ecological Elements, the EO may represent a stand or patch of a natural community, or a cluster of stands or patches of a natural community. Because they are defined on the basis of biological information, EOs may cross jurisdictional boundaries.

EO rank: Status based on an assessment of the likelihood that if current conditions continue, an *Element Occurrence* (EO) will persist for a defined period of time (e.g., 100 years). EO ranks are assigned on the basis of data obtained from field surveys and are based on *EO rank specifications*. See [Appendix E](#) for a list of EO ranks and their definitions.

EO rank specifications: Criteria that are used for making a succinct assessment (i.e., of estimated *viability* (species), or ecological *integrity* (ecological elements), or probability of persistence, of an *Element Occurrence* (EO), which is recorded as an *EO rank*. These criteria are based on size, condition, and landscape context factors. *EO rank specifications* are developed in a global context, such that the best occurrence of an element in a particular jurisdiction or geographic area may not be highly ranked.

EO record: A data management tool that has both spatial and tabular components including a mapable feature and its supporting database. *Element Occurrences* (EOs) are typically represented by bounded, mapped areas of land and/or water. EO records are most commonly created for current or historically known occurrences of natural communities or native species of conservation interest. They may also be created, in some cases, for extirpated occurrences or occurrences of invasive nonindigenous species.

EO specifications: Criteria that are used to delineate and differentiate *Element Occurrences* (EOs). In other words, EO specifications define precisely what evidence constitutes a valid EO (i.e., the minimum size, quality, or persistence required), and what distances or factors separate one principal EO from another.

- F -

- G -

- H -

- I -

Inferred extent (IE) is a buffer distance applied to ensure that *Element Occurrences* (EOs) mapped as points or small polygons are brought up to a size that corresponds with the spatial minimum spatial requirements of the element, typically an animal with significant spatial requirements. This distance is equal to the home range or the distance from an initial location (in any direction) that would encompass the ultimate destination of 75-90% of the dispersing adult individuals. This distance is standardized across the NatureServe network, but can be adjusted if the spatial requirements of the species are consistently different in a particular area.

Integrity: The maintenance of structure, species composition, and the rate of ecological processes and functions of an ecological system or community within the bounds of normal disturbance regimes. Occurrences with ecological integrity must meet minimum size requirements defined for the element on the [Element Properties window](#) in Vista. [also referred to as *Ecological Integrity* and *Landscape Integrity*]

- J -**- K -****- L -**

Landscape integrity: An integrated measure of key ecological attributes that are thought to support a suite of specified conservation elements on a specified land/waterscape, and the degree to which these attributes occur within expected ranges of natural variation. [*also referred to as Integrity*]

Land use intent: Intentional actions on the land, including management practices. Described by a class name, land use intent has both major and minor classes. Major categories describe general land uses, such as "working landscapes," "development," and "converted," and are refined by minor classes that describe the level of land use intensity within the major class (i.e., the degree to which land use negatively impacts biological elements).

Locational uncertainty:

Locational uncertainty distances:

LUI: Land use intent.

- M -

Minimum mapping unit:

- N -

NatureServe conservation status:

- O -

- P -

Policy type: Mechanism that guides the implementation of a land use, including processes that prevent or reliably enforce the land use designated for the area operating under that policy, and/or prevent a land use of greater intensity than that currently in effect.

Precision is a term that was used to indicate mapping uncertainty in the legacy Biological and Conservation Database (BCD) system developed by The Nature Conservancy, which served as a foundation for NatureServe Biotics.

Protection: A term indicating that an element will continue to persist at a location due to land use intent (LUI) categories (described in [Appendix F](#)) that are *compatible* with the element at that location, along with a *policy type* (described in [Appendix G](#)) in effect that will reliably enforce the designated land use and/or prevent land uses of greater intensity (which would likely negatively impact element persistence).

Protected areas map:

PT: Policy type.

- Q -

- R -

Raster

Representation Accuracy (RA) is a rating that indicates the relative amount of an EO polygon that is estimated to be occupied by the Element (i.e., not attributable to uncertainty). An estimated RA should be provided for all Eos to provide a common index for the consistent comparison of EO polygons, thus helping to ensure that data are correctly analyzed and interpreted.

- S -

Scenario component layer:

Source Feature

- T -

- U -

- V -

Viability: A statement of the relative quality and/or health of a specified population of individuals that indicates a set of key ecological attributes, including a minimum size and a threshold of condition, that are thought to support the population on-site; and suggests a probability of its persistence over a specified time period given relatively constant conditions. Viable occurrences must meet minimum size requirements defined for the element on the [Element Properties window](#) in Vista.

Vector**- W -****- X -****- Y -****- Z -**

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