

Natural Landscape Assessment: Ecological Core (VA)



Tags

Virginia Natural Landscape Assessment, VaNLA, Natural Land Network, Green Infrastructure

FGDC Metadata (read-only)

Identification

CITATION

CITATION INFORMATION

ORIGINATOR Virginia Department of Conservation and Recreation

PUBLICATION DATE 2007-06-27

TITLE

Virginia Natural Landscape Assessment (VaNLA) Ecological Cores

GEOSPATIAL DATA PRESENTATION FORM vector digital data

PUBLICATION INFORMATION

PUBLICATION PLACE Richmond, Virginia, USA

PUBLISHER Virginia Department of Conservation and Recreation

ONLINE LINKAGE http://www.dcr.virginia.gov/natural_heritage/vclna.shtml

LARGER WORK CITATION

CITATION INFORMATION

ORIGINATOR Virginia Department of Conservation and Recreation

TITLE

Virginia Conservation Lands Needs Assessment

DESCRIPTION

ABSTRACT

The Virginia Natural Landscape Assessment (VaNLA), a component of the Virginia Conservation Lands Needs Assessment (VCLNA), is a landscape-scale GIS analysis for identifying, prioritizing, and linking natural habitats in Virginia. Using land cover data derived from satellite imagery, the VaNLA identifies unfragmented natural habitats called Ecological Cores, large patches of natural land cover (mainly upland forests and forested wetlands statewide, but also marshes, beaches, and dunes in the coastal plain) with at least 100 acres of interior conditions. Large, medium, and small Ecological Cores have been identified, along with a smaller feature type called Habitat Fragments that may be important in the more urban localities. Ecological Cores provide habitat for a wide range of species, from those dependent upon interior forests to habitat generalist, as well as species that utilize marsh, dune, and beach habitats. Ecological Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection), and carbon sequestration, along with the associated economic benefits of these functions.

PURPOSE

The VaNLA generates fundamental ecological data layers for conservation of land and natural resources in Virginia.

SUPPLEMENTAL INFORMATION

The associated table named VaNLA_Cores_Heavy_LUT.dbf can be joined to the shapefile named VaNLA_Cores_Lite.shp to add 37 more attributes. All joins and relates should use the COREID field. See VaNLA_Cores_Heavy_LUT_metadata.txt for descriptions of these additional attributes.

TIME PERIOD OF CONTENT

TIME PERIOD INFORMATION

SINGLE DATE/TIME

CALENDAR DATE circa 2000

CURRENTNESS REFERENCE

RESAC 2000 Land Cover

STATUS

PROGRESS Complete

MAINTENANCE AND UPDATE FREQUENCY As needed

SPATIAL DOMAIN

BOUNDING COORDINATES

WEST BOUNDING COORDINATE -84.230112

EAST BOUNDING COORDINATE -75.042339

NORTH BOUNDING COORDINATE 39.761333

SOUTH BOUNDING COORDINATE 36.161913

KEYWORDS

THEME

THEME KEYWORD THESAURUS none

THEME KEYWORD Virginia Natural Landscape Assessment

THEME KEYWORD VaNLA

THEME KEYWORD Natural Land Network

THEME KEYWORD Green Infrastructure

PLACE

PLACE KEYWORD THESAURUS none

PLACE KEYWORD Virginia

PLACE KEYWORD Mid-Atlantic

ACCESS CONSTRAINTS

none

USE CONSTRAINTS

none

POINT OF CONTACT

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HOURS OF SERVICE 7:30 AM - 4:15 PM

Data Quality

LINEAGE

PROCESS STEP

PROCESS DESCRIPTION

The study area includes the entire commonwealth of Virginia and a 20-mile buffer around the state. This large buffer was selected to prevent truncation of cores and corridors that cross the state boundary and to facilitate edge matching to similar projects conducted in adjacent states.

The Virginia Department of Conservation and Recreation contracted with the University of Maryland (UMD) to develop a land cover layer for the entire state from Landsat Thematic Mapper satellite imagery. The final product, named RESAC 2000, was derived from imagery dating from 1999 to 2001. RESAC 2000 has 21 classes, nine of which represent natural land covers: Barren, Deciduous Forests, Evergreen Forests, Mixed Forests, Deciduous Wooded Wetlands, Evergreen Wooded Wetlands, Emergent Herbaceous Wetlands, Mixed Wetlands, and Natural Grass. An overall thematic accuracy of 90% was reported for this layer. The resolution of this layer is 30-meters, square.

The RESAC 2000 layer had only a very small buffer around the state, ergo additional imagery was acquired for coverage of the entire study area. Imagery from the Chesapeake Bay Resource Lands Assessment (also developed by UMD), National Land Cover Data (NLCD) 2001, and one piece of NLCD 1992 were merged to RESAC 2000. The NLCD classifications were cross-walked to match RESAC 2000 and all images were projected to Lambert Conformal Conic before merging.

Despite the high reported accuracy of RESAC 2000, there were several important classification errors that needed to be corrected. An accuracy assessment utilizing a five-percent random sample of the Natural Grass class revealed that it almost always represented hayfield or pasture, therefore this class was reclassified to agriculture. There were also maritime grass communities and marshes that were misclassified as agriculture. The marshes were corrected using National Wetlands Inventory (NWI) data, after excluding farmed wetlands, and the maritime grasses were reclassified to a new class of the same name using high-resolution photography to confirm the occurrences were not agriculture. Beaches and dune areas were in the Barren class of RESAC 2000. In order to extract these important natural land covers, undeveloped beaches and dunes were digitized from high-resolution aerial photography dated 2002 (Virginia Base Mapping Program) and the resulting polygons were used to reclassify these areas to a new class named Undeveloped Beaches/Dunes. The resulting layer is known as VANLA Land Cover.

The VANLA Land Cover was used to develop the VANLA cores, which are defined for this analysis as patches of natural cover containing at least 100 acres of interior cover. Interior cover begins 100 meters inward from the patch edge. This 100-meters buffer constitutes the abiotic transition zone following the "three-tree-height" rule (Harris 1984), since fully mature forests in Virginia reach maximum height around 33 meters.

The first step in the core development process was to assemble a fragmentation layer that included spatial data for powerlines, pipelines, railroads, and roads. This layer was used to fragment the VANLA Land Cover, thus making a better approximation of the fragmentation in the landscape. Anthropogenic land covers were excluded from the analysis at this point by extracting from the fragmented land cover layer only the following classes and then classifying them as natural cover: Deciduous Forests, Evergreen Forests, Mixed forests, Deciduous Wooded Wetlands, Evergreen Wooded Wetlands, Emergent Herbaceous Wetlands, Mixed Wetlands, Undeveloped Beaches/Dunes, and Maritime Grasses. One pixel width of near-shore open water was added back from the fragmented land cover to the natural cover layer. This prevented narrow stretches of open water less than 60 meters across (two pixel widths) from splitting a core into two or more smaller patches. The interior areas of the patches in the natural cover layer were identified by using distance analysis to calculate the 100-meter abiotic transition zone of each patch. Interior areas greater than or equal to 10 acres were then identified; all patches not meeting this criterion were excluded from further analysis. The abiotic transition zone was added back to the remaining interior areas. These patches were then classified into Large Cores if they had at least 10,000 acres of interior cover, Medium Cores if they had 1,000 to 9,999 acres of interior cover, Small Cores if they had 100 to 999 acres of interior cover, and Habitat Fragments if

they had 10 to 99 acres of interior cover. The Habitat Fragments feature type resulted from a pilot study for the VANLA completed in 2004 (Weber & Carter-Lovejoy) which revealed that the 100-acres minimum interior size for cores was too restrictive for urban and some suburban localities. These features may contain natural heritage resources and have utility for recreation, open space, and storm water management, but they are too small or narrow to provide many of the other benefits of cores.

Analyses were performed to add many prioritization attributes to the cores and habitat fragments layer. Definitions and justifications for each of these prioritization attributes can be found in the attributes section of this metadata document or in the metadata for the additional attributes table.

PROCESS DATE 2007-05-09

Spatial Reference

HORIZONTAL COORDINATE SYSTEM DEFINITION

PLANAR

PLANAR COORDINATE INFORMATION

PLANAR COORDINATE ENCODING METHOD coordinate pair

COORDINATE REPRESENTATION

ABSCISSA RESOLUTION 0.000000

ORDINATE RESOLUTION 0.000000

PLANAR DISTANCE UNITS meters

GEODETTIC MODEL

HORIZONTAL DATUM NAME North American Datum of 1983

ELLIPSOID NAME Geodetic Reference System 80

SEMI-MAJOR AXIS 6378137.000000

DENOMINATOR OF FLATTENING RATIO 298.257222

Entities and Attributes

DETAILED DESCRIPTION

ENTITY TYPE

ENTITY TYPE LABEL VaNLA_Cores_Lite

ATTRIBUTE

ATTRIBUTE LABEL FID

ATTRIBUTE DEFINITION

This field contains the Internal Feature Number, a unique sequential number that is automatically generated by ArcGIS 9.1 software.

ATTRIBUTE DEFINITION SOURCE ESRI

ATTRIBUTE DOMAIN VALUES

UNREPRESENTABLE DOMAIN

Sequential unique whole numbers that are automatically generated.

ATTRIBUTE

ATTRIBUTE LABEL Shape

ATTRIBUTE DEFINITION

This field contains the feature geometry, the coordinates defining the features.

ATTRIBUTE DEFINITION SOURCE ESRI

ATTRIBUTE DOMAIN VALUES

UNREPRESENTABLE DOMAIN

Coordinates defining the features.

ATTRIBUTE

ATTRIBUTE LABEL COREID

ATTRIBUTE DEFINITION

This field contains a unique numeric identifier for each VANLA Core or Habitat Fragment.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL TYPE

ATTRIBUTE DEFINITION

This field identifies the type of VANLA feature.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE DOMAIN VALUES

ENUMERATED DOMAIN

ENUMERATED DOMAIN VALUE LC

ENUMERATED DOMAIN VALUE DEFINITION

Large Core: a core area with at least 10,000 acres of interior cover

ENUMERATED DOMAIN

ENUMERATED DOMAIN VALUE MC

ENUMERATED DOMAIN VALUE DEFINITION

Medium Core: a core area with 1,000 - 9,999 acres of interior cover

ENUMERATED DOMAIN

ENUMERATED DOMAIN VALUE SC

ENUMERATED DOMAIN VALUE DEFINITION

Small Core: a core area with 100 to 999 acres of interior cover

ENUMERATED DOMAIN

ENUMERATED DOMAIN VALUE HF

ENUMERATED DOMAIN VALUE DEFINITION

Habitat Fragment: a patch of natural land cover with 10 to 99 acres of interior cover

ATTRIBUTE

ATTRIBUTE LABEL EO_COUNT

ATTRIBUTE DEFINITION

This field contains the number of Natural Heritage Element Occurrences per VANLA Core or Habitat Fragment. These occurrences exclude records without dates, with dates prior to 1981, or with poor spatial precision (minutes or general precision).

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL TIER1EHACR

ATTRIBUTE DEFINITION

This field contains the acreage of potential and confirmed habitats for Tier 1 species, the species of greatest conservation need in Virginia, per VANLA Core or Habitat Fragment. The source of these data is the Virginia Wildlife Action Plan that was developed by the Virginia Department of Game and Inland Fisheries.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL SRMAX

ATTRIBUTE DEFINITION

This field contains the maximum value of potential species richness values of vertebrates and lepidopterans per VANLA Core or Habitat Fragment based of potential distribution maps developed by the Virginia GAP.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL TOTALACRES

ATTRIBUTE DEFINITION

This field contains the total acreage of each VANLA Core or Habitat Fragment.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL DEPTHINTER

ATTRIBUTE DEFINITION

This field contains the depth of interior of each VANLA Core or Habitat Fragment. This value represents the maximum distance (meters) from all edges that can be achieved within a core or

habitat fragment. This parameter is useful for selecting and modeling cores that provide more protection for interior species.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL THREAT

ATTRIBUTE DEFINITION

This field indicates the threat if not conserved of each VANLA Core or Habitat Fragment. The values indicate the potential land use change from the current use to an urban or suburban use. Values range from 1, lowest potential of conversion, to 8, greatest potential of conversion. The source of these data is the Virginia Vulnerability Model, VCLNA.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL DRINKACRE

ATTRIBUTE DEFINITION

This field contains the acreage of high priority groundwater and surface water protection zones per VANLA Core or Habitat Fragment. The source of these data is the Virginia Department of Health Office of Drinking Water.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL UMNWIACRES

ATTRIBUTE DEFINITION

This field contains the acreage of unmodified wetlands per VANLA Core or Habitat Fragment. Unmodified wetlands are based on National Wetlands Inventory data from which farmed, diked, ditched, and otherwise modified wetlands were removed. Beaver impoundments, which are a natural form of modification, were left in the unmodified wetlands layer.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL UMNWIPERC

ATTRIBUTE DEFINITION

This field contains the percent area of unmodified wetlands per VANLA Core or Habitat Fragment. Unmodified wetlands are based on National Wetlands Inventory data from which farmed, diked, ditched, and otherwise modified wetlands were removed. Beaver impoundments, which are a natural form of modification, were left in the unmodified wetlands layer.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL PercConsVa

ATTRIBUTE DEFINITION

This field contains the percentage of each core or habitat fragment that is already conserved according to DCR's Conservation Lands Database (as of 21 August 2006).

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL SitesIndex

ATTRIBUTE DEFINITION

This field contains the Conservation Sites Index, which resulted from summing the products of B-rank factors and B-rank weights. The B-rank factors resulted from dividing conservation site and core intersections by the total area of intersecting conservation sites with the same B-rank. The weights were 50, 40, 30, 20, and 10 for B1, B2, B3, B4, and B5 ranked conservation sites, respectively.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL SCUIndex

ATTRIBUTE DEFINITION

This field contains the Stream Conservation Units (SCU) and Threatened and Endangered (T&E) Waters Index, which resulted from summing the products of B-rank factors and B-rank weights. The T&E Waters were buffered to the same width (5 meters) as SCUs and assigned B-ranks before

they were merged with the SCUs. The B-rank factors resulted from dividing intersections of the T&E-SCU features and cores by the total area of intersecting T&E-SCU features with the same B-rank. The weights were 50, 40, 30, 20, and 10 for B1, B2, B3, B4, and B5 ranked T&E-SCU features, respectively. The T&E Waters layer was developed by Virginia Department of Game and Inland Fisheries.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE

ATTRIBUTE LABEL ECM

ATTRIBUTE DEFINITION

This field contains scores from the Ecological Composite Model used to assess ecological integrity. Definition of Ecological Integrity: Maintaining vital natural landscapes is essential for basic ecosystem services such as cleaning our air and filtering our water. Natural lands also harbor thousands of species of animals and plants and contain libraries of genetic information from which we derive new foods, materials, and medicinal compounds. These parts of the landscape also provide us with recreational opportunities and open space resources. But these qualities are represented differently across the cores and habitat fragments that constitute the natural landscape. To assess their unique values, each core and habitat fragment has been assigned an ECOLOGICAL INTEGRITY score that rates the relative contribution of that area to the ecosystem service values above. In general, larger, more biologically diverse areas are given higher scores. Scores are enhanced if the core or habitat fragment is part of a larger complex of natural lands. Scores also are increased for those cores and habitat fragments that contribute to water quality enhancement.

ATTRIBUTE DEFINITION SOURCE Review Team

ATTRIBUTE

ATTRIBUTE LABEL EI_Class

ATTRIBUTE DEFINITION

This field represents the ecological integrity scores from the ECM summarized in 5 classes.

ATTRIBUTE DEFINITION SOURCE JTW

ATTRIBUTE DOMAIN VALUES

ENUMERATED DOMAIN

ENUMERATED DOMAIN VALUE 1

ENUMERATED DOMAIN VALUE DEFINITION

Outstanding

ENUMERATED DOMAIN

ENUMERATED DOMAIN VALUE 2

ENUMERATED DOMAIN VALUE DEFINITION

Very High

ENUMERATED DOMAIN

ENUMERATED DOMAIN VALUE 3

ENUMERATED DOMAIN VALUE DEFINITION

High

ENUMERATED DOMAIN

ENUMERATED DOMAIN VALUE 4

ENUMERATED DOMAIN VALUE DEFINITION

Moderate

ENUMERATED DOMAIN

ENUMERATED DOMAIN VALUE 5

ENUMERATED DOMAIN VALUE DEFINITION

General

Distribution Information

DISTRIBUTOR

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HOURS OF SERVICE 7:30 AM - 4:15 PM

RESOURCE DESCRIPTION Downloadable Data
DISTRIBUTION LIABILITY

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STANDARD ORDER PROCESS

DIGITAL FORM

DIGITAL TRANSFER INFORMATION
FORMAT NAME ESRI Shapefile
TRANSFER SIZE 128.194

DIGITAL TRANSFER OPTION

ONLINE OPTION

COMPUTER CONTACT INFORMATION
NETWORK ADDRESS

TECHNICAL PREREQUISITES

End user must have GIS software capable of importing and displaying ESRI shapefiles.

Metadata Reference

METADATA DATE 2008-03-11

METADATA CONTACT

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METADATA STANDARD NAME FGDC Content Standards for Digital Geospatial Metadata

METADATA STANDARD VERSION FGDC-STD-001-1998

METADATA TIME CONVENTION local time