Welcome to the Virginia Natural Heritage Data Explorer (NHDE) Help. Please choose a menu item from above to proceed. You can navigate through this PDF help document by scrolling to the top to reach the menu, or by enabling bookmarks in Adobe Reader by clicking the bookmark icon in the left panel. Additionally, you can click any hyperlinks in the document (blue underline text). If you cannot find the assistance you need, please contact a DCR Natural Heritage staff member at: nhdesupport@dcr.virginia.gov

You can download a PDF version of the NHDE user guide using this link: NHDE User Guide

For additional information about NHDE, visit the Virginia Natural Heritage Program’s NHDE webpage.

For best results, this site should be viewed in Firefox version 3.6 or higher, Google Chrome, or Safari version 3 or higher.

A screen resolution of at least 1024 x 768 is also recommended for using the Map Viewer and the Species/Natural Community Search. While the NHDE site and map viewer may function in some tablet and smartphone formats, it was not specifically developed to be fully functional on these devices.
Map Navigation and Use
Hover over an area of the screenshot below until the hand becomes a pointer; click to learn more about that specific component of the map viewer.

Map Viewer Basics
**DCR-Natural Heritage:** Click this logo to go to the homepage for the Virginia Natural Heritage program, the host program for this interactive mapping site.

**Login Status and Account Info:**
You do not need to register, or have an account to use the NHDE. All publicly available map layers and analysis and mapmaking tools are available to anyone. However, if you wish to access sensitive data, or to have the ability to submit projects for review, you will need to register first.

If you are **not a registered NHDE user**, click “Register” to obtain access to the site. You will be asked a view account validation questions, and an email will be sent to you, for authentication purposes. A link in that email can be used to request Tiered access to sensitive data and information from DCR-Natural Heritage. DCR-Natural Heritage will then respond with details to register you with a unique password and access level based on your need for the site.

If you are a **registered user**, you may click “Login.” Enter your password to enter the site at your assigned tier level, which will provide you with access to the site as per your registration. You can also click “Your Account” to be taken to a
page that allows you to view and edit your personal information, as well as view your profile, history, and group membership.

**NAVIGATION BAR**

The green navigation bar provides easy access to various components of the NHDE. Note that the tab in which you are working at a given time is tan (for example, the Map tab shown below)

<table>
<thead>
<tr>
<th>Home</th>
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**Home:** The Virginia Natural Heritage Data Explorer home page, consisting of basic information about access to the NHDE, as well as a login/registration window.

**My Subscription:** This tab is more pertinent to subscribed users. View and edit group membership, and search other groups. Two pull-down options are available under this tab: Create Subscription, in which the user can create and become the administrator of a particular subscription, and My Projects, in which the user can view any projects they have submitted to VA Heritage staff for review. See the [Access and Permissions - Tier 1, 2, 3](#) section of this help document for more information related to creating subscriptions.

**Map:** Map Viewer, where the user can view and analyze map layers that summarize conservation status and values of lands, as well as reference and boundary map layers. Subscribed users can access Natural Heritage data and submit projects for review (see below for more information about using the Map Viewer.)

**About Us:** Basic information about the Virginia Department of Conservation and Recreation’s Division of Natural Heritage and its mission.

**Contact Us:** Contact information for the VA DCR-DNH and NHDE support.

**Help:** Help documentation for effective use and understanding of the Natural Heritage Data Explorer, including navigating the map and using map tools, creating and submitting projects, using the species/community search, how-to instructions, frequently asked questions, subscription information, map layer descriptions, etc.

**Species/Community Search:** The species/community search enables the user to search the Natural Heritage Program’s database to generate tabular reports summarizing rare species and natural communities by a variety of attributes. See the [Species/Community Search](#) section of this help document for more information about this tool and guidance on its use.

**Terms and Conditions:** Disclaimers related to the use of NHDE as an environmental review tool as well as terms and conditions that must be adhered to if accessing sensitive Natural Heritage data. All users of this website are required to adhere to these Terms and Conditions.

**Basic Map Navigation:**

**Scale Bar:** Click at a point along the scale bar (shown left) to zoom to a specific extent. Or, slide the scale block up and down to zoom in and out, respectively.

Note: the map scale and coordinates are visible in the bottom left hand corner of the map viewer (example below) and change accordingly when the scale bar or any other navigation tools are used.
Overview Map: located in the upper right corner of the map viewer.
- Show/hide the Overview Map by toggling the arrow icons in the upper right corner of the overview map.
- Drag the gray box to alter the map extent; the main map will adjust accordingly.

Panning – to shift the viewable area, click and hold anywhere on the map and slide the cursor/mouse.

Zoom in – double click anywhere on the map to zoom in and re-center the map window on that location. If using a mouse with a scroll wheel, scroll up to zoom in.

Zoom out - If using a mouse with a scroll wheel, scroll down to zoom out.

Hotkey Shortcut Tips:
Zoom in - Hold the SHIFT key while dragging a box on the map.
Zoom out - Hold SHIFT and CTRL keys simultaneously while dragging a box on the map.

Map Tools
Switch Basemap: The default basemap is National Geographic. Click “Switch Basemap” to select from seven other basemap options. To expand the Switch basemap window, to see all options, click and hold the bottom right corner of the window and drag down and right.

Add Resource: Click to import and use additional layers (via map services) in the map viewer by entering a url and title for the layer in the respective fields of the dialog box.
Submit Project: Clicking submit project opens a draw/edit toolbar, which allows subscribers to submit projects to Natural Heritage staff for site specific project review. For more information about this tool, see the How Do I help section and click on “How do I Submit a Project for Review?”

Tool buttons are used to navigate around the map, and to view and query datasets.

Identify tool: Identify a feature from a data layer by selecting the layer from the pull-down menu and clicking on the feature of interest. Related information will appear in the details window.

The details window returns the identify results:
Within the details window, the following tools can be used:

- **Zoom**: Zooms to the feature,
- **Flash**: flashes feature

If more than one feature is identified, navigate between them by:

- Using the arrows (left) to step back and forth through the set of features, or selecting the desired feature dialog from the dropdown list (right)

**Measure Tool**: Measure area and distance, as well as identify the coordinates of a location. Choose the unit of measurement from the dropdown list when measuring area or distance.

To create the feature to be measured, select the desired type of measurement (area, distance, or location.) Digitize, or draw, a polygon for area and draw a line for distance using the mouse and clicking along the shape boundary or line. Double click on the last point to finish the polygon or line. Click a point for coordinates. The measurement result is returned in the units specified within the measure window. Change the unit to change the units of the result accordingly.
Print: Create a printable version of the map view. Click the print button and when the Print Map window opens, enter a title for the map, its author, any copyright information, and toggle the “Print” pull-down to select the paper setting.

Zoom to Coordinates or Scale: Zoom to a specific location by selecting one of the predefined scale options or entering latitude and longitude coordinates, making sure to specify the appropriate projection.

Spatial Bookmarks: Bookmark the map at a particular extent and location to return to for later use. Click the spatial bookmarks icon once the map is at the desired location and extent and type in a name for the bookmark. The bookmark will then appear in the spatial bookmarks window.

Default Extent: Zoom to the full view of all data layers.

Previous Extent: Moves the map window back to the previous view. Note: the button will appear grey if there are no previous views available.

Next Extent: Moves the display to the next view. Note: the button will appear grey if there are no next views available.
**Find address or place:** Search for a place by typing a desired location in the text box. If searching for an address, include city, state and/or zip code. Hit “Enter” or click the “Find Location” magnifying glass icon to zoom to the location on the map. The default map scale when searching on an address or place is 1:9028K; this scale is too large for the Terrain with Labels and Oceans basemaps to display. If either of these basemaps is being used, one must zoom out after searching to a scale of 1:72,224K. Note: You may need to specify that some locations are in Virginia.

**Map Tabs**

**Note:** the menu can be minimized by clicking the blue arrow to the right of the tabs (left). The active tab, or the tab currently in use at any given time, is white.

**Layers Tab:** Displays the available map layers for view and query in the map window.

- Map layers are grouped by type, denoted by the grey heading (e.g.“Conservation Planning”). These groups can be expanded or collapsed by clicking that heading title in the gray bar.

- A layer can be turned on and off by clicking the check box. Note that several layers are "scale dependent" meaning that they are only visible at certain map scales based on the most appropriate scale for that layer. If a map layer’s features are grayed out, then it can’t be viewed at that scale.

- The symbology for each map layer can be hidden or expanded by clicking the + or -, to the left of the check box for a layer.

- When the mouse is hovered over a layer name, an arrow appears to the right of it. Clicking this arrow displays a menu with the option to adjust the layer’s transparency as it appears on the map, move the layer up and down amongst other layers within the layer menu, zoom to the full extent of that layer, remove it (if it was added by the user), or view its map service details in another web browser tab.

- See [Map Layers](#) section for detailed descriptions of each layer

**Table 1.** Viewing scale thresholds for all layers on the NHDE Map Viewer.

<table>
<thead>
<tr>
<th>Map Layer</th>
<th>Display Threshold: Minimum Scale</th>
<th>Display Threshold: Maximum Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Heritage Resources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element Occurences</td>
<td>1:577,791</td>
<td>1:1,128</td>
</tr>
<tr>
<td>NH Screening Layer (Conservation Sites, GLNHRs, SCUs)</td>
<td>1:577,791</td>
<td>1:1,128</td>
</tr>
<tr>
<td><strong>Predictive Models</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabase Screening Layer</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Eastern Prairie Fringed Orchid</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Karst Bedrock</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Species/Model</td>
<td>Threshold</td>
<td>Scale</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>--------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Madison Cave Isopod</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Michaux's Sumac</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Northeastern Bulrush</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Peter's Mountain Mallow</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Seabeach Amaranth</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Small Whorled Pogonia</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Small-antered Bittercress</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Virginia Round-leaf Birch</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td><strong>Managed Conservation Lands</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managed Conservation Lands</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td><strong>Conservation Planning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural Model</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Cultural Asset Model</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Ecological Cores</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Forest Economics Model</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Recreational Assets Model</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Vulnerability Model</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Watershed Integrity Model</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td><strong>Karst Research</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dye Inputs</td>
<td>1:288,895</td>
<td>1:72,224</td>
</tr>
<tr>
<td>Monitor Points</td>
<td>1:288,895</td>
<td>1:72,224</td>
</tr>
<tr>
<td>Dye Trace Vectors</td>
<td>1:288,895</td>
<td>1:72,224</td>
</tr>
<tr>
<td><strong>Reference Layers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24K Grid</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>National Wetlands Inventory</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Scenic Rivers</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Streams (NHD)</td>
<td>1:288,895</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Trails</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trailheads</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Driving Trails</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>State Trails</td>
<td>No threshold</td>
<td>1:2,311,162</td>
</tr>
<tr>
<td>USGS Placenames</td>
<td>1:72,224</td>
<td>1:1,128</td>
</tr>
<tr>
<td>VDOT Roads</td>
<td>1:288,895</td>
<td>1:1,128</td>
</tr>
<tr>
<td><strong>Boundaries</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counties</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Physiographic Provinces</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Planning Districts</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Subwatersheds (12 Digit USGS)</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Watersheds (8 digit USGS, subbasin)</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Virginia Boundary</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td><strong>Basemap</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imagery</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Imagery with Labels</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Streets</td>
<td>No threshold</td>
<td>1:4,514</td>
</tr>
<tr>
<td>Topographic</td>
<td>No threshold</td>
<td>1:1,128</td>
</tr>
<tr>
<td>Terrain with Labels</td>
<td>No threshold</td>
<td>1:72,224</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td>Light Gray Canvas</td>
<td>No threshold</td>
<td>1:9,028</td>
</tr>
<tr>
<td>National Geographic</td>
<td>No threshold</td>
<td>1:9,028</td>
</tr>
<tr>
<td>Oceans</td>
<td>No threshold</td>
<td>1:72,224</td>
</tr>
</tbody>
</table>

**Map Making tab:** Create printable maps by digitizing an annotation layer on the map viewer. Points, lines, polygons, and text are available in many styles, sizes, and colors to satisfy a variety of mapping purposes.

Selecting Add Polygons (shown above) or Add Lines opens a Draw/Edit window, where users can upload zipped shapefiles to use as annotation geometries as well as use various editing tools to refine map-making:

See the [How Do I... help section](#) for some examples on how to use this tool.

**Find/Results tab:** Search additional, or back-end data associated with map layers under this tab. Select the map layer to search within in the drop down menu for “Resource.” Searches can be conducted “By Attributes,” or by entering text in
the layer-specific search dialogues, or “By Spatial,” by clicking/selecting features on the map. Search results can be instantly viewed in a list, at the bottom of the Find/Result window, and within the map window.

For example, Managed Conservation Lands can be searched by type, management agency or size, as well as searched based on other map layers, such as county or planning district boundaries. For more information on this tool please see the Find/Results help page.
Map Layers

NATURAL HERITAGE RESOURCES

Element Occurrences: Visible and available for query to Tier 3 users and available after project submittal to Tier 2 users. Elements are plants, animals and exemplary natural communities, which are tracked by the Virginia Natural Heritage Program due to their rarity. An Element Occurrence is the location of a single extant habitat containing one or more individual elements. Each occurrence (i.e. Element Occurrence) is represented by a polygon indicating its known location. The polygons are intended to indicate the full known areal extent of the occurrence, modified to account for any known locational uncertainty of the source data. (Source: VA DCR, Division of Natural Heritage)

NH Screening Layer: This layer can be seen all Tier levels and queried at the Tier 3 level. There are three separate components to the NH Screening Coverage:

- **Conservation Sites** each identify a planning boundary delineating the Virginia Natural Heritage Program's best determination of the land and water area occupied by one or more natural heritage resources (exemplary natural communities and rare species) and necessary to maintain ecological processes that will facilitate their long-term survival. The size and dimensions of a conservation site are based on the habitat requirements of the natural heritage resources present and the physical features of the surrounding landscape. Features taken into consideration include hydrology, slope, aspect, vegetation structure, current land uses, and potential threats from invasive species. Conservation sites do not necessarily preclude human activities but a site’s viability may be greatly influenced by human activities. Conservation sites may require ecological management, such as invasive species control or water management, in order to maintain or enhance their viability. Each conservation site is given a biodiversity significance ranking based on rarity, quality, and number of natural heritage resources it contains. There are over 1300 terrestrial site records in the Conservation Sites coverage; these sites encompass all viable, recently-verified terrestrial element occurrences documented in our database.

- **Stream Conservation Units** (SCUs) identify stream reaches that contain aquatic natural heritage resources, including upstream and downstream buffer and tributaries associated with the reach. There are over 400 SCUs, and these sites encompass all viable, recently-verified aquatic element occurrences documented in our databases. SCUs are given a biodiversity significance ranking based on the rarity, quality, and number of natural heritage resources they contain. SCUs can be used to identify land management needs and protection priorities. They can also be used as a screening tool, to identify potential conflicts with development activities, and they can be used for proactive planning to ensure that development projects successfully avoid or enhance natural heritage resources.

- **General Location Areas** for Natural Heritage Resources represent the approximate locations of documented natural heritage resource occurrences that were not incorporated into Conservation Sites, either because they are poor quality, their location was not precisely identified, or they have not been reverified in over 20 years. These approximate locations, marked with a one-mile-diameter circle, are included in the Screening Coverage because they indicate areas with relatively high potential for natural heritage resource occurrences to be redocumented. Depending on the apparent suitability of local habitat, DCR-Natural Heritage may recommend biological surveys when reviewing projects that intersect these locations. Some general location areas are not circular polygons. For these records a review of recent aerial photography in conjunction with known habitat needs for the element may indicate if potential habitat might exist within the limits documented in the original occurrence.

PREDICTIVE MODELS

Diabase Screening Layer

This is a digital representation of diabase soils with potential for some rare, threatened and endangered plant species. Diabase glades are characterized by historically fire-dominated grassland vegetation on relatively nutrient-rich soils underlain by Triassic bedrock. Diabase flatrock, a hard, dark-colored volcanic rock, is found primarily in northern Virginia
counties and is located within the geologic formation known as the Triassic Basin. Diabase soils were isolated from county soil survey data and NRCS soils data. These soils were further analyzed using digital orthophotography (VA Basemap Imagery), and areas where the landscape appeared to be disturbed or currently under heavy cultivation were removed. In Northern Virginia, diabase supports occurrences of several global and state rare plant species: earleaf foxglove (*Aglonis auriculata*, G3/S1), white heath aster (*Symphyotrichum ericoides*, G5/S3), blue-hearts (*Buchnera americana*, G5?/S1S2), hairy beardtongue (*Penstemon hirsutus*, G4/S3), downy phlox (*Phlox pilosa*, GST5/S2), stiff goldenrod (*Oligoneuron rigidum var. rigidum*, GST5/S2), and marsh hedgenettle (*Stachys pilosa var. arenicola*, GST4?/S1).

**Karst Bedrock**

This layer was derived from VDMR, 2003. CD ROM (ISO-9660), Publication 174: Digital Representation of the 1993 Geologic Map of Virginia. Bedrock units containing significant karstic strata were selected and converted to a statewide layer consisting of these units only. Projects taking place within or immediately adjacent to these units have the potential to encounter karst hazards as well are rare, threatened, or endangered fauna and natural communities associated with karst landscapes.

**Madison Cave Isopod**

This is a simple model based on the intersection of the karst bedrock layer with sampling sites for the Madison Cave Isopod. High, moderate, and low probabilities are designated by the author (Karst Protection Coordinator Wil Orndorff) based on proximity to positive or negative sampling sites, bedrock geology, and surface and groundwater hydrology.

**Predicted Suitable Habitat for Rare Plant Species**

The Predicted Suitable Habitat (PSH) layers aid protection of rare plants by identifying potential habitats that might be affected by proposed development or other alterations. When a project boundary intersects one or more PSH layers, a biologist will need to review the project to assess impacts and may request a site survey for the species.

Each PSH was modeled with the random forests classifier (Liaw and Wiener 2002) in the R statistical environment using over 50 environmental variables (Table 1). The random forests classifier has been shown to have very high accuracy and the ability to model complex interactions among predictor variables (Cutler et al. 2007). The models were trained with randomly distributed points collected within natural heritage element occurrences, polygons delimiting documented locations of the species of interest, and a set of 5,000 background points collected as a stratified random sample within EPA Level IV ecoregions.

**Table 2.** List of environmental variables used to model PSH.

<table>
<thead>
<tr>
<th>Environmental Variable</th>
<th>Description</th>
<th>Source or Derived From</th>
</tr>
</thead>
<tbody>
<tr>
<td>aspect9cats</td>
<td>aspect categorized as 8 cardinal and intercardinal directions plus flat</td>
<td>USGS 1/3 arc second DEM</td>
</tr>
<tr>
<td>ecolevelivva</td>
<td>Level IV Ecoregions</td>
<td>USEPA Ecoregions</td>
</tr>
<tr>
<td>landform4va</td>
<td>Landform Model (modified from SWReGap)</td>
<td>USGS 1/3 arc second DEM</td>
</tr>
<tr>
<td>nlcd0610m4sdm</td>
<td>National Land Cover Data</td>
<td>NLCD 2006</td>
</tr>
<tr>
<td>slope9cats</td>
<td>slope divided evenly into 9 categories of degrees</td>
<td>USGS 1/3 arc second DEM</td>
</tr>
<tr>
<td>soilhyd</td>
<td>hydric soil</td>
<td>U.S. General Soil Map (STATSGO2)</td>
</tr>
<tr>
<td>soilpartsz</td>
<td>soil particle size</td>
<td>U.S. General Soil Map (STATSGO2)</td>
</tr>
<tr>
<td>bio01anmtem</td>
<td>annual mean temperature</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio02dmiirran</td>
<td>mean diurnal range (mean of monthly (max temp - min temp)]</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio03isotherm</td>
<td>isothermality - comparison of day-to-night and summer-to-winter temperature oscillations</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio04tempseasy</td>
<td>temperature seasonality (STD * 100)</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio05mxwarmmh</td>
<td>maximum temperature of warmest month</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio06micoldmh</td>
<td>minimum temperature of coldest month</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio07temanran</td>
<td>temperature annual range (max temp warmest month - min temp coldest month)</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio08temwetqr</td>
<td>mean temperature of wettest quarter</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio09temdryqr</td>
<td>mean temperature of driest quarter</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio10temwq</td>
<td>mean temperature of warmest quarter</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio11temclqr</td>
<td>mean temperature of coldest quarter</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio12annprec</td>
<td>annual precipitation</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio13precwetm</td>
<td>precipitation of wettest month</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio14precdrym</td>
<td>precipitation of driest month</td>
<td>WorldClim</td>
</tr>
<tr>
<td>bio15preseas</td>
<td>precipitation seasonality - normalized dispersion (CV) of precipitation</td>
<td>WorldClim</td>
</tr>
</tbody>
</table>
The following plant species have PSH layers available on NHDE:

- Eastern Prairie Fringed Orchid
- Michaux’s Sumac
- Northeastern Bulrush
- Peter’s Mountain Mallow
- Seabeach Amaranth
- Small Whorled Pogonia
- Small-anthered Bittercress
- Virginia Round-leaf Birch

Contact the Virginia Natural Heritage Program for more information.

Citations


**MANAGED CONSERVATION LANDS**

**Managed Conservation Lands**: Public and private conservation and recreation lands in Virginia. Includes properties protected by conservation easements under the Virginia Outdoors Foundation and other public and private qualified easement holders; lands managed by state and federal natural resource agencies; local government lands owned and managed for open space values excluding ball fields or other heavily developed areas; open space university lands that are protected from development; and permanently protected private conservation organization lands. (Source: VA DCR, Division of Natural Heritage)

<table>
<thead>
<tr>
<th><strong>Attribute</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Name</td>
<td>Name of the managed area</td>
</tr>
<tr>
<td>Management Type</td>
<td>Land category or group</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bio16precwetq</td>
<td>precipitation of wettest quarter WorldClim</td>
</tr>
<tr>
<td>bio17predryq</td>
<td>precipitation of driest quarter WorldClim</td>
</tr>
<tr>
<td>bio18precwarm</td>
<td>precipitation of warmest quarter WorldClim</td>
</tr>
<tr>
<td>bio19preccldq</td>
<td>precipitation of coldest quarter WorldClim</td>
</tr>
<tr>
<td>canopy_1_30r</td>
<td>mean percent canopy cover in 3x3 window of 30-meter cells resampled to 10 meters NLCD 2001 Canopy Cover</td>
</tr>
<tr>
<td>canopy_30</td>
<td>mean percent canopy cover in 30-cell radius (10 meter cells) NLCD 2001 Canopy Cover</td>
</tr>
<tr>
<td>canopy_9</td>
<td>mean percent canopy cover in 9-cell radius (10 meter cells) NLCD 2001 Canopy Cover</td>
</tr>
<tr>
<td>canopy_99</td>
<td>mean percent canopy cover in 99-cell radius (10 meter cells) NLCD 2001 Canopy Cover</td>
</tr>
<tr>
<td>demintx10</td>
<td>elevation as integer x10 USGS 1/3 arc second DEM</td>
</tr>
<tr>
<td>demstdrad10</td>
<td>STD of elevation in radius of 10 cells USGS 1/3 arc second DEM</td>
</tr>
<tr>
<td>demstdrad30</td>
<td>STD of elevation in radius of 30 cells USGS 1/3 arc second DEM</td>
</tr>
<tr>
<td>demstdrad99</td>
<td>STD of elevation in radius of 99 cells USGS 1/3 arc second DEM</td>
</tr>
<tr>
<td>gdd5</td>
<td>Growing Degree Days, with 5° Celsius base temperature WorldClim</td>
</tr>
<tr>
<td>imsu0610m4sdm</td>
<td>Percent impervious NLCD 2006</td>
</tr>
<tr>
<td>nlcd06_for30</td>
<td>mean forest cover within 30-cell radius NLCD 2006</td>
</tr>
<tr>
<td>nlcd06_for99</td>
<td>mean forest cover within 99-cell radius NLCD 2006</td>
</tr>
<tr>
<td>nlcd06_opn30</td>
<td>mean open cover within 30-cell radius NLCD 2006</td>
</tr>
<tr>
<td>nlcd06_opn99</td>
<td>mean open cover within 99-cell radius NLCD 2006</td>
</tr>
<tr>
<td>nlcd06_shb30</td>
<td>mean shrub cover within 30-cell radius NLCD 2006</td>
</tr>
<tr>
<td>nlcd06_shb99</td>
<td>mean shrub cover within 99-cell radius NLCD 2006</td>
</tr>
<tr>
<td>nlcd06_wat30</td>
<td>mean water cover within 30-cell radius NLCD 2006</td>
</tr>
<tr>
<td>nlcd06_wat99</td>
<td>mean water cover within 99-cell radius NLCD 2006</td>
</tr>
<tr>
<td>nlcd06_wet30</td>
<td>mean wetland cover within 30-cell radius NLCD 2006</td>
</tr>
<tr>
<td>nlcd06_wet99</td>
<td>mean wetland cover within 99-cell radius NLCD 2006</td>
</tr>
<tr>
<td>precjuly</td>
<td>July precipitation WorldClim</td>
</tr>
<tr>
<td>precjune</td>
<td>June precipitation WorldClim</td>
</tr>
<tr>
<td>precmay</td>
<td>May precipitation WorldClim</td>
</tr>
<tr>
<td>slopex10nt</td>
<td>slope in degrees as integer x10 USGS 1/3 arc second DEM</td>
</tr>
<tr>
<td>trmim4va</td>
<td>Topographic Relative Moisture Index (modified from SWReGap) USGS 1/3 arc second DEM</td>
</tr>
</tbody>
</table>
### Management Agency
Entity responsible for managing the conservation interest of the property.

### Owner
Property owner

### Management Level
Federal, State, Private, Local, or Virginia Outdoors Foundation

### Public Access
Public access available for the property

### Total Acres
Total acreage for a complete land unit, possibly including several smaller tracts

### GIS Acres
Acreage calculated by the GIS mapping software. Varies based on mapping accuracy

### Web Link
Web link to additional information or information about the land manager

**NOTE:** Acreage values are not split by county or watershed boundaries. Any watershed or county-based query reflects the total acreage values for all intersecting lands and some acreage totals may appear inflated. Acreage does not include water bodies.

### CONSERVATION PLANNING
*Several map layers are provided to assist in conservation planning efforts in Virginia. These layers comprise The Virginia ConservationVision. Developed originally as the Virginia Conservation Lands Needs Assessment (VCLNA) by Virginia DCR-Natural Heritage in 2008, revision of these maps and GIS layers is currently underway. Virginia ConservationVision helps users to make conservation decisions strategically, via accounting for the interests of different conservation stakeholders, and the public. The following provides a brief definition of each ConservationVision layer. More background on Virginia ConservationVision can be found on the DCR-Natural Heritage ConservationVision page.*

#### Agricultural Model
The Virginia Agricultural Model identifies relative agricultural value of land in Virginia. Natural criteria such as slope, soil type, and prime farmland designation were used to identify landscape features. Cultural features from the Virginia Department of Historic Resources were used to identify historic farms.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Value Rank</td>
<td>Agricultural Model relative rank of agricultural value based on model input parameters</td>
</tr>
</tbody>
</table>

**Cultural Asset Model:** The Cultural Asset Model displays the location and relative value of cultural assets in the state of Virginia in an effort to promote awareness and conservation of our cultural assets. This map layer is symbolized to display the relative cultural value of land in Virginia as determined by the presence of certain known cultural assets: designated archaeological site, architectural site (on Historic Register, or proposed for Historic Register as of 2006), and/or an American Indian Land. These input datasets were assigned weights by the Virginia Department of Historic Resources, and these weights were used by DCR-Natural Heritage to assign map symbology based on the co-occurrence of significant cultural assets.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mapped Cultural Assets</td>
<td>Total cultural value</td>
</tr>
</tbody>
</table>

**Ecological Cores:** The Virginia Natural Landscape Assessment (VaNLA) is a landscape-scale GIS analysis that has identified, prioritized, and linked important lands to form natural land networks throughout Virginia. Using land cover...
data derived from satellite imagery, the VaNLA identified large, unfragmented cores, which are patches of natural land with at least 100 acres of interior cover. Cores provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as for species that utilize marsh and maritime habitats. The cores layer represents cores as polygons that are symbolized by Ecological Integrity scores, calculated from an Ecological Composite Model (ECM). 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 ecosystem services such as wildlife and plant habitat, biodiversity conservation, open space, recreation, water resources protection, erosion control, sediment retention, protection from storm and flood damage, crop pollination, and carbon sequestration. 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.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Integrity Class</td>
<td>Represents the ecological integrity scores from ECM summarized in 5 classes</td>
</tr>
<tr>
<td>Ecological Integrity Score</td>
<td>Ecological integrity score resulting from the Ecological Composite Model (ECM) for each core or habitat fragment</td>
</tr>
<tr>
<td>Total Acres</td>
<td>Total acreage of each core or habitat fragment</td>
</tr>
</tbody>
</table>

**Forest Economics Model:** The Forest Economics Model was developed to show ranked forest lands with economic value. Biophysical parameters evaluating forest suitability and productivity, management constraints, timber harvesting constraints and socioeconomic data were assessed to create a forest economic layer showing ranked forest land in Virginia.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Economics Rank</td>
<td>Forest economic value showing the relative forest rank based on model input parameters</td>
</tr>
</tbody>
</table>

**Recreational Assets Model:** The Virginia Recreation Model was developed to show recreational value of land in Virginia. Data shows presence of public recreational opportunities. This dataset was created using the following datasets: Trails (DCR-DNH), Boating access points (VADGIF), Beaches (VIMS), Conservation Lands (DCR-DNH), Parks (DCR-DNH), Scenic Rivers (DCR-DNH), Fishing Lakes (VADGIF), Tidal Waters (DCR-DNH), Trout Streams (VADGIF), Navigable Water (VADGIF), Hunting Lands (VADGIF), VA Birding Trails (VADGIF), Scenic Byways (DCR-DNH). Input map layers were combined in an additive fashion, so that the model output indicates a sum total of the recreational assets present, based on inputs.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mapped Recreational Assets</td>
<td>The value representing the number of recreational assets present based on input parameters</td>
</tr>
</tbody>
</table>
Vulnerability Model: The Vulnerability Model represents predicted growth patterns in Virginia. The polygon values are based on a scale of 1 to 8 indicating the relative potential threat of urban, suburban and rural growth into the landscape. Data inputs used to calculate threat of development scores, and to develop this 1-to-8 ranking, incorporated 1990 and 2000 census block data, parcel data, existing roads data, and travel distance, in order to estimate the directions and rates of development up to the year 2010. A value of 8 indicates a hotspot of growth and a value of 1 represents a low threat growth into the landscape.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threat of Development</td>
<td>Threat value associated with predicted growth pressure. The higher the value, the greater the threat</td>
</tr>
<tr>
<td>Score</td>
<td></td>
</tr>
<tr>
<td>8: Highest Development Threat</td>
<td></td>
</tr>
<tr>
<td>7:</td>
<td></td>
</tr>
<tr>
<td>6:</td>
<td></td>
</tr>
<tr>
<td>5:</td>
<td></td>
</tr>
<tr>
<td>4:</td>
<td></td>
</tr>
<tr>
<td>3:</td>
<td></td>
</tr>
<tr>
<td>2:</td>
<td></td>
</tr>
<tr>
<td>1: Lowest Development Threat</td>
<td></td>
</tr>
</tbody>
</table>

Watershed Integrity Model: The Virginia Watershed Integrity Model was developed to show the relative value of land as it contributes to the integrity of associated watersheds and the biological health of associated aquatic communities. The Watershed Integrity Model ranks important terrestrial features that should be conserved in the interest of for water quality integrity based on the best available data related to slope, wetland presence, land use, forest fragmentation, streams, public source water protection areas, ecological cores (intact forest blocks), as well as indices of terrestrial and aquatic habitat suitability.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watershed Integrity Rank</td>
<td>Water quality integrity value showing important terrestrial features that contribute to watershed or water quality integrity.</td>
</tr>
<tr>
<td>5: Outstanding</td>
<td></td>
</tr>
<tr>
<td>4: Very High</td>
<td></td>
</tr>
<tr>
<td>3: High</td>
<td></td>
</tr>
<tr>
<td>2: Moderate</td>
<td></td>
</tr>
<tr>
<td>1: General</td>
<td></td>
</tr>
</tbody>
</table>

KARST RESEARCH

Dye Inputs, Monitor Points, Dye Trace Vectors: These layers represent the generalized dye trace vectors, injection points, and monitoring points associated with dye trace studies performed by a variety of authors in Virginia's karst region. Users requiring local details should consult the original, referenced publication, if available, or contact the DCR Natural Heritage Karst Protection Coordinator. In some cases, locations are generalized and/or offset to protect sensitive locations. Details on these locations are available on a case by case basis. The primary purpose of these coverages is to alert the user to the fact that information on hydrological studies for the area is available. Absence of karst research layer vectors or points in a specific area does not necessarily mean that no detailed studies have been performed.
REFERENCE LAYERS

24K Grid - Digital Raster Graphics Grid: This dataset represents the outlines for the digital versions of the USGS 1:24,000 scale USGS topographic maps. (Source: U.S. Geological Survey)

NWI Layer: National Wetlands Inventory. This dataset represents the extent, approximate location, and type of wetlands and deepwater habitats in the coterminous United States. These data delineate the areal extent of wetlands and surface waters as defined by Cowardin et al. (1979). (Source: U.S. Fish and Wildlife Service http://www.fws.gov/wetlands/)

Scenic Rivers: State Scenic Rivers in Virginia as designated by the General Assembly. (Source: Virginia Department of Conservation and Recreation)

Streams (NHD): The National Hydrography Dataset (NHD) is a comprehensive set of digital spatial data that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells. Within the NHD, surface water features are combined to form "reaches," which provide the framework for linking water-related data to the NHD surface water drainage network. These linkages enable the analysis and display of these water-related data in upstream and downstream order. The NHD is based upon the content of USGS Digital Line Graph (DLG) hydrography data integrated with reach-related information from the EPA Reach File Version 3 (RF3). The NHD supersedes DLG and RF3 by incorporating them, not by replacing them. Users of DLG or RF3 will find the National Hydrography Dataset both familiar and greatly expanded and refined. http://nhd.usgs.gov/ (Source: U.S. Geological Survey)

Trails: Currently includes the Appalachian Trail, trails located in many Virginia State Parks, National Forests and Shenandoah National Park, and some other major trails. State Trails include existing trails, on-road routes and proposed trails that connect to create a state or regionally significant network of trails. These data are updated as more information becomes available; visit http://www.dcr.virginia.gov/recreational_planning/tr-sbib2.shtml for additional details. (Source: VA DCR, NPS, USFS, Appalachian Trail Conference)

USGS Placenames: Includes all features labeled on Virginia’s USGS Topographic Quadrangles. (Source: U.S. Geological Survey)

VDOT Roads: Statewide Virginia Department of Transportation data including state maintained highways. (Source: Virginia Department of Transportation)

BOUNDARIES

Counties: County boundaries. (Source: VA-DCR Division of Stormwater Management)

Physiographic Provinces: A physiographic province is a landform region, an area delineated according to similar terrain that has been shaped by a common geologic history. Each province is characterized overall by its elevation, relief, lithology, and geologic structure. (Source: VA DCR, Division of Natural Heritage)

Planning Districts: There are 21 planning districts in Virginia, each exists under the jurisdiction of a separate Planning District Commission (PDC). (Source: Virginia Geographic Information Network)

Subwatersheds (12 digit USGS): The boundaries of the 494 hydrologic units in Virginia at the 14 digit level of detail. This dataset covers the whole state and these units are the immediate subsets of the 11 digit level of hydrologic units in Virginia. Developed for finer watershed planning work in the state than the 11 or 8 digit level of hydrologic unit allows. This level is the basis for Virginia's non-point source pollution assessment and ranking. It is the official statewide hydrologic unit delineation for water quality reporting. (Source: EPA / VA-DCR Division of Stormwater Management)

Watersheds (8 digit USGS, subbasin): The United States is divided and sub-divided into successively smaller hydrologic units, or watersheds, which are classified into four levels: regions, sub-regions, accounting units, and cataloging units.
The hydrologic units are arranged within each other, from the smallest (cataloging units) to the largest (regions). Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to eight digits based on the four levels of classification in the hydrologic unit system. (Source: VA-DCR Division of Stormwater Management)

**Virginia Boundary:** Virginia state boundary (Source: VA-DCR Division of Natural Heritage)

**Basemap:** Basemaps are used to give geographical context for the layers displayed in the map viewer and can be changed based on the particular users’ needs. The basemap gallery provided on NHDE contains imagery, imagery with labels, streets, topographic, terrain, canvas, National Geographic, and ocean maps. Users also have the option to add their own basemap via a mapservice (see Add Resource help section). Note: The default map scale when using the “Search on Address or Place” tool is 1:9028K; this scale is too large for the Terrain with Labels and Oceans basemaps to display. If either of these basemaps is being used, one must zoom out after searching to a scale of 1:72,224K.
Access and Permissions - Tier 1, 2, and 3

The Natural Heritage Data Explorer has 4 levels of access based on the needs of our constituents and partners.

Public Access includes the ability to:
- Display and query map layers including county boundaries, streams, trails, wetlands, watersheds, conservation planning layers and managed conservation lands.
- Use a suite of tools to explore Virginia and perform basic analyses including feature queries, area measurements, etc.
- Search a map layer for a certain feature and zoom to it, or display more detailed information.
- Zoom into an area and view data layers with any map gallery basemaps.
- Draw a polygon boundary for an area of interest and add text labels.

Tier 1 includes the ability to:
- Perform all functions available to Public Access users.
- Display Natural Heritage Screening Coverage features and predictive models.
- Delineate a proposed project boundary or upload a project boundary shapefile and submit a project for review.
- Receive automatically, a PDF format report of Natural Heritage Screening Coverage features intersecting with the boundary and a table listing the screening features within a two-mile buffer of the project boundary.

Tier 2 includes the ability to:
- Perform all functions available to Public Access and Tier 1 users.
- Delineate a proposed project boundary or upload a project boundary shapefile and submit a project for review.
- Receive automatically, a PDF format report of Natural Heritage Screening Coverage features, and species and community locations, that intersect within a two-mile buffer of the project boundary. This report will also include a table listing those screening features and Natural Heritage resources which intersect with the two-mile buffer of the project area.

Tier 3 includes the ability to:
- Perform all functions available to Public Access, Tier 1 and Tier 2 users.
- View and query Natural Heritage Screening Coverage features and Natural Heritage tracked species boundaries within the map viewer.

Any NHDE user can use the site at the Public Access level, without registering, logging in, or subscribing to the site. In order to access the sensitive natural heritage resource information and project review functionality at Tier I, II or III access levels, a user must create an account. This account will enable a user to assign a username and password for login to access the site at their Tier level of functionality.

Creating an account

Click on ‘Register’ on the top right hand corner of any NHDE page, or on the home page, click ‘Create new account’ under the login menu or the creating a website account link in the subscription access section.

1. Supply the required information on the registration page (denoted by red asterisks). Once the form is filled out, click ‘Create new account’ at the bottom of the page.
2. You will see a message on the NHDE home page, indicating that a temporary password and further instructions have been sent to the email address entered during account creation. This is done to make sure that the email address entered was valid and to cut down on spam submissions.
3. Open the email and click on the link provided to activate the new account.
4. Click the ‘Log in’ button on the Reset Password page. Log in to the site using the temporary username and password from the email. Once logged in, enter and confirm the new password and click ‘Save.’ A message will appear at the top of the page to say that the changes have been saved; the new account is now enabled.

Now that you have an account, you may either:
a. Create a subscription, where you will be the Subscription Admin, or primary member of that subscription,
b. Join an existing subscription, or group, to become a Subscription Member. If you are joining a subscription, then you will have been invited, via email, by that subscription’s admin. Joining the subscription will give you the same Tiered access level as that admin, and all others in that group.

My Subscription: Any user with an account will have a ‘My Subscription’ link in the navigation bar.

- **My Subscriptions:** This will take you to a page that states your subscription group name and lists the admin of your group. You can also view group members and edit your profile information here.

- **Create Subscription:** This is where you can request your subscription.

- **My Projects:** This will allow you to see a list of projects you have submitted. You will not be able to see projects submitted by anyone else in your group.

**Differing roles and who does what?**

There are two main roles with differing permissions and responsibilities regarding subscriptions:

- **Subscription admin:** The user that created a subscription. This admin user can invite other users (i.e. subscription members) to join the subscription group, approves membership requests, and can cancel any other user’s membership in the group. The subscription admin is Virginia Natural Heritage’s point of contact for anything involving the subscription.

- **Subscription member:** member that is joined to a subscription group. The Subscription admin invites members to join a subscription group.

**Subscription admin: create and add users to a subscription**

1. Once you have an account and are logged in, click on the 'Create Subscription’ link under the ‘My Subscription’ menu tab on the navigation bar.
2. Fill out a subscription name and description on the Create Subscription page and click Save. An email will be sent to VA Natural Heritage informing them that a subscription has been created. At this point, the new subscription provides site use at a public access level, which does not include sensitive Natural Heritage resource information.
3. VA Natural Heritage reviews the subscription and upon receipt of a signed license agreement and completion of training gives Tiered access to sensitive Natural Heritage Resource Information. VA Natural Heritage sends you an email stating notifying you of the Tiered access level for your subscription.
4. You are now a Subscription Admin and can invite users to join your subscription. Click on ‘My Subscription’ link in the navigation bar.
5. On the ‘My Subscription’ page, click your subscription’s name. You will see your subscription page, stating your Tiered access level.

6. Click the ‘Invite friend’ link in the top left menu, add the email addresses of up to 10 invitees at a time making sure you include a line space or comma between each email address, and click ‘Send invitation.’ There can be more than 10 members of a subscription, even though only 10 may be invited at a time (see graphic, at right).

7. These invited members will receive the invitation via email. They will either create an account and then log in or if they already have an account, will log in to NHDE and request to join the group.

8. The request must be approved by the admin in order for the user to be a member; the admin will receive an email from ‘vanhde’ that includes two links; the first of which instantly approves the request, and the second of which can be used to deny the request or manage members.

Subscription member: join a subscription

1. A group admin will send an email asking you to join the group. Click on the link to create an account if you are not currently registered. If you already have an account, click the link in the email to log in.

2. Log in to your account.

3. Click on the last link provided in the email to join the group. A page appears asking if you are sure you want to join.

4. Click on “Request membership” and add any details (optional, see image below). Your membership request is sent via email to the group admin for approval.

5. Once the group admin approves the request, you will receive an email confirming your membership in the subscription group, and a separate email notifying you of your new subscription level.
6. You can now view your Tier level on the main group page and can also manage your group membership status by clicking on ‘My membership’ on the left hand panel (see red boxes in graphic, below).

```
DRCNH_InfoMan

* Invite friend
* 3 members
* Manager: jason.bulluck
* My membership

Group admins

jason.bulluck - admin

Recent members

danielle.kulas
megan.rollins
jason.bulluck - admin

Tier level:
Tier III
```

Resetting user password
Please note that the NHDE user is responsible for resetting passwords; VA Natural Heritage is not able reset NHDE user passwords. To change your password, while logged in to NHDE, click on the “your account” button on the top right corner of the screen (if the password has been forgotten and needs to be reset, go to the next page):

```
Welcome back, danielle.kulas
Your Account | Logout
```

Under the “Edit” tab, enter the new password in both “Password” and “Confirm password” fields and click save at the bottom of the page to reset the user password. A message will appear indicating that the changes have been saved.
If the password has been forgotten and you cannot log in to NDHE, click on the “Request new password” button on the user login menu on the home page:

Enter your email address in the user account menu and click “E-mail new password.” A message will appear indicating that further instructions have been sent to the e-mail address you supplied.

Click on the link provided in the email; it will take you to a one-time log in that will expire after one day. Click “Log in” and follow the steps to change your password provided in the beginning of this section.
The Find/Results tab allows users to search back-end data associated with map layers by entering text, or selecting features on the map. Search results can be instantly viewed in a list and within the map window.

**Resource:** The layer on which the search is to be performed

**By Attributes section:** allows the user to search the layer of interest by its attributes; in this example; the Managed Conservation Lands layer can be searched on by the its name, management type, the management agency, management level, type of public access available, and size range in acreage.

Note: searchable fields change based on the layer that the search is being performed on. That is, the fields in the By Attributes section will alter based on the layer specified in the resource pull-down list.

**By Spatial section:** allows the user to spatially search the layer of interest

**Search By:** a subset of features can be selected by a spatial search; either an area delineated by the user (box, polygon, point, or line), or selected by its relation to another layer in the map viewer (Features from Other Resource).
**Search Type:** This field determines how the search is performed in regards to how the layer of interest relates to its spatial search criteria (so if searching by a box, the user can determine what features intersect the box, are contained by the box, or the box lies completely within).

Note: depending on the **Search By** input, additional options (such as the ability to apply a buffer to the search input or the ability to draw the search input freehand) will become available.

The different types of spatial searches are outlined as follows (this example uses a box as **Search By** criteria on the Managed Conservation Lands layer):

Use the pull-down options on the **By Spatial** search menu to select the desired search input. Click “Select by Drawing” then draw the spatial graphic (a box, in this case) in the appropriate location on the map viewer. Click “Search” and the results will become highlighted on the map viewer, with their details displayed in the results menu.

“Intersects” selects all features in the layer of interest that touch the spatial graphic.
“Contains” selects the features of the layer of interest that are contained by the spatial graphic.

“Within” selects the feature that the spatial graphic lies entirely within.

Note that in addition to the search by box option, all of the above examples apply to the polygon Search By option. Point and line Search By criteria do not have the Search Type selection “contains,” as these features are not appropriate for that search type.

Box, point, line, and polygon search types provide the capability to search using a buffer:

- **Search By:** Point
  - Use Buffer: 1 Miles
  - Search Type: Intersects
  - Select by Drawing
Line and polygon search types can be drawn freehand:

For some examples on how to use Find/Result, visit the How do I section and click on “How do I search for a certain feature in a layer?”
How do I...

Turn map layers on and off?

View topographic maps and aerial photography?

Use the Species/Community Search?

Retrieve information about a particular feature?

Zoom to a particular map coordinate?

Submit a project?

Add and edit polygon annotation to my map?

Add and edit line annotation to my map?

Add and edit point annotation to my map?

Make a map with text labels?

Print a map?

Find a location of interest?

Search for a certain feature in a layer?

Search for Conserved Lands in a given County?

Access an outside map service for use in the map viewer?

Import a shapefile to the map viewer?

Get help through NHDE support?

- **Turn map layers on and off?**
  
  There's a check box next to each map layer. Click this box to toggle the layer on and off. Some of the layers are "scale dependent" meaning that they are only available at certain map scales. This is done to maximize the performance of the site as some layers would take a long time to display and refresh at smaller (more zoomed out) scales. Layer names are grayed out in the legend if a layer is unavailable at your current scale.

- **View topographic maps and aerial photography?**
  
  These are available as basemaps on the map. All basemap layers can be viewed when [Switch Basemap](#) is clicked at the top left corner of the map viewer; eight different basemaps are available. Select the picture of the desired map and the map viewer will refresh accordingly. The current basemap being used is visible as the last layer listed on the Layers menu.
- **Use the Species/Community Search?**
  The following are three screenshot examples of different ways to use the Species/Community Search feature of NHDE. For more detailed information on this tool and how to find more in-depth help in using it, see the [Species/Community Search](#) section of this document.

  - To search for a federally endangered species in Highland County, select search terms as displayed in blue highlighting below:

    ![Species/Community Search](image)

    Click Search to view the results or Reset to enter different search criteria:

    ![Search Results](image)

    **Natural Heritage Resources**

    | Common Name/Natural Community | Scientific Name | Global Conservation Status Rank | State Conservation Status Rank | Federal Legal Status | State Legal Status | statewide Occurrences |
    |-------------------------------|-----------------|---------------------------------|-------------------------------|---------------------|-------------------|-----------------------|
    | Highland                      |                 |                                 |                               |                     |                   |                       |
    | BIVALIA (MUSSELS)             |                 |                                 |                               |                     |                   |                       |
    | James Spiny Mussel            | Pleuraxerius collina | G1                              | S1                            | LE                  | LE                | 30                    |
    | MAMMALS                        |                 |                                 |                               |                     |                   |                       |
    | Virginia Big-eared Bat        | Cynotis virginiana | G4T2                           | S1                            | LE                  | LE                | 20                    |
    | Indiana Bat                   | Myotis sodalis   | G2                              | S1                            | LE                  | LE                | 25                    |
    | VASCULAR PLANTS               |                 |                                 |                               |                     |                   |                       |
The user has the option to click "Print to PDF" to open a PDF of the results for saving or printing.

To search for *Alasmidonta heterodon* in the Upper Aqua Creek-Cannon Creek subwatershed of the Lower Potomac River watershed, enter the species name (scientific name or common name) and select search terms as displayed in blue highlighting below:

- **Common Name/Natural Community:**
- **Scientific Name:** Alasmidonta heterodon
- **Taxonomic Group:**
  - Select All
  - Vascular Plants
  - Non-Vascular Plants
  - Amphibians
  - Birds

- **Global Conservation Status Rank:**
  - Select All
  - G1 - Critically Imperiled
  - G2 - Imperiled
  - G3 - Vulnerable

- **State Conservation Status Rank:**
  - Select All
  - S1 - Critically Imperiled
  - S2 - Imperiled
  - S3 - Vulnerable

- **Federal Legal Status:**
  - Select All
  - LE - Listed Endangered
  - LT - Listed Threatened
  - PE - Proposed Endangered

- **State Legal Status:**
  - Select All
  - LE - Listed Endangered
  - LT - Listed Threatened
  - PE - Proposed Endangered

- **County:**
  - Harrisonburg (City)
  - Henrico
  - Hanover

- **Physiographic Province:**
  - Allegheny Mountains
  - Cumberland Mountains
  - Northern Blue Ridge

- **Watershed:**
  - 02070000 - Middle Potomac-Cacocaw
  - 02070010 - Middle Potomac-Anacost
  - 02070011 - Lower Potomac River
  - 02080100 - Lower Chesapeake Bay

- **Subwatershed:**
  - PH51 - Potomac River-Tank Creek
  - PH55 - Beavertown Run
  - PH56 - (Upper) Aqua Creek-Cannon
  - PH57 - (Lower) Aqua Creek-Austin P.

Click Search to view the results or Reset to enter different search criteria:

**Natural Heritage Resources**

**Lower Potomac**

(Upper) Aqua Creek-Cannon Creek

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Global Conservation Status Rank</th>
<th>State Conservation Status Rank</th>
<th>Federal Legal Status</th>
<th>State Legal Status</th>
<th>Statewide Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwarf Wedge mussel</td>
<td>Alasmidonta heterodon</td>
<td>G1G2</td>
<td>S1</td>
<td>LE</td>
<td>34</td>
</tr>
</tbody>
</table>
The user has the option to click to open a PDF of the results for saving or printing.

- To search for Globally imperiled and State critically imperiled fish in the Cumberland Mountains Physiographic Province, select search terms as displayed in blue highlighting below:

```
By Attributes

Common Name/Natural Community:

Scientific Name:

Taxonomic Group:
- FISH
- MAMMALS
- REPTILES
- AMPHIBIANS
- ANNELEIDAS (Segmented worms)
- APACHNIDA (Spiders & Pseudoscorpia)

Global Conservation Status Rank:
- Select All
- G1 - Critically Imperiled
- G2 - Imperiled
- G3 - Vulnerable

State Conservation Status Rank:
- Select All
- S1 - Critically Imperiled
- S2 - Imperiled
- S3 - Vulnerable

Federal Legal Status:
- Select All
- LE - Listed endangered
- LT - Listed threatened
- PE - Proposed endangered

State Legal Status:
- Select All
- LE - Listed endangered
- LT - Listed threatened
- PE - Proposed endangered

Select Operand:
- AND
- OR

County:
- Harrisonburg (City)
- Henry
- Highland

Physiographic Province:
- Allegheny Mountains
- Cumberland Mountains
- Northern Blue Ridge

Watershed:
- Select All
- 02040303 - Chincoteague
- 02040304 - Eastern Lower Delmarva
- 02070001 - So. Branch Potomac Riv.

Subwatershed:
```

Click Search to view the results or Reset to enter different search criteria:

<table>
<thead>
<tr>
<th>Natural Heritage Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxonomic Group: FISH</td>
</tr>
<tr>
<td>Global Conservation Status Rank: G2 - Imperiled</td>
</tr>
<tr>
<td>State Conservation Status Rank: S1 - Critically Imperiled</td>
</tr>
<tr>
<td>Physiographic Province: Cumberland Mountains</td>
</tr>
</tbody>
</table>

Click scientific names below to go to NatureServe report.
Click column headings for an explanation of species and community ranks.

<table>
<thead>
<tr>
<th>Common Name/Natural Community</th>
<th>Scientific Name</th>
<th>Global Conservation Status Rank</th>
<th>State Conservation Status Rank</th>
<th>Federal Legal Status</th>
<th>State Legal Status</th>
<th>Statewide Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cumberland Mountains</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FISH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backside Crake</td>
<td><strong>Chromis cumbdenensis</strong></td>
<td><strong>G2</strong></td>
<td><strong>S1</strong></td>
<td>LT</td>
<td>LT</td>
<td>5</td>
</tr>
<tr>
<td>Ashy Darter</td>
<td><strong>Etheostoma cichorium</strong></td>
<td><strong>G2</strong></td>
<td><strong>S1</strong></td>
<td>BOC</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>
The user has the option to click to open a PDF of the results for saving or printing.

- **Retrieve information about a particular feature?**
  To retrieve a snapshot of information about a particular feature on the map, click the *identify tool* (i.e. the blue circle with the “i” in the toolbar, shown here in the red box) and the identify window will appear:

  Use the blue arrow to open the pull-down menu and click on the layer of interest. Click on a feature with the mouse pointer. The selected feature will highlight blue, and a details window will appear, with attribute information related to that particular feature. Clicking the “Zoom” button in the identify window will zoom to and center the map on the selected feature. Clicking the “Flash” button in the identify window will illuminate the selected feature for a few seconds.

- **Zoom to a particular map coordinate?**
  Click on the magnifying glass icon (shown with red box at right) on the toolbar. A *Zoom to Coordinates or Scale* window will open with the option of latitude/longitude coordinates in either decimal degrees or degrees minutes seconds, UTM coordinates for both zones 17 and 18, or defined projections. Click the arrow to open the projection pull-down, and click on the appropriate projection. Once the projection is selected, enter coordinates in the following format:
    - Latitude/Longitude (DMS) can either be in _d _’ _“ format (example below) or just the numbers with spaces in between. Longitude must be negative.
- Latitude/Longitude (Decimal) are entered as two digit numbers with decimals (example below). Longitude must be negative.

- UTM (make sure to specify zone 17 or zone 18) is entered as a 7 digit number with decimals for the Northing, and a 6 digit number with decimals for the Easting (example below):

- Define Projection: enter Well Known ID (WKID) or Well Known Text (WKT)

  **Note:** WKID and WKT values can be found here: [http://www.spatialreference.org/](http://www.spatialreference.org/)

  Also, the WKT can be copied from a projection (.prj) file.
Specify a scale at which to view the map, then click Zoom (the smaller the number, the more closely it is zoomed). The map will center and a red diamond icon will appear on the coordinates entered. The diamond marker will move to the center point of wherever the map is zoomed, while the Zoom To tool is open. When the Zoom To window is closed, the marker goes away.

- **Submit a project?**

1. Locate the area of interest by zooming to coordinates or using an address to find your location. You can also shift/click and drag a box to zoom in or double click the map to zoom into a location.

2. Click on the submit project button in the gray bar just above the map window: A draw/edit toolbar will appear.
3. Upload a shapefile at any scale by clicking on the upload shapefile button.

4. In the upload shapefile window, click on the "Select File To Upload" button and browse to select a zipped shapefile with all the parts of an ESRI shapefile, a KML file or a GML file.

5. To draw a project boundary, instead of uploading a shapefile, you must be zoomed in to a scale of 1:72,224 or closer. Note, if tool icons in the Draw/Edit toolbar are gray, you are not zoomed in close enough to draw a project boundary.

6. To start drawing click on and draw the project boundaries by clicking and dragging on the map, clicking at each change of direction, or vertex.

7. You can edit this polygon while drawing it, using the Draw/Edit tools as follows:
   a. edit to click and move a vertex.
b. erase spaces to remove areas that are fully contained by the project boundary (think doughnut holes). This is best used once your project shape is complete. Simply draw the area to be removed within the boundary, the same way you drew the boundary itself.

c. crop to remove sections of the project boundary that include part of the boundary. This is best used once your project shape is complete. Simply draw the area of the polygon you wish to keep.

d. buffer to buffer your polygon. This is best used once your project shape is complete. You will be asked to enter a buffer distance.

e. undo last to undo your last drawing action, such as a misplaced point

f. redo last to redo your last undo

g. delete to delete a boundary, or shape, entirely

h. change settings to change settings of Draw/Edit tools; to lock the map in place, so panning does not interfere with boundary drawing, and to enable freehand drawing.

8. Double click the last point in your polygon to complete it. Then click Accept in the Draw/Edit toolbar.

9. A window will open allowing for entry of project information about the project.
10. Enter project information into the fields. Any field with an asterisk must be filled in to submit a project. See graphic below for an example.

![Project Submission Form]

- **Project Number:**
- **Project Title:**
- **Project Description:**
- **Site Conditions:**
- **Contact Name:** Danielle Kulas
- **Company Name:** Virginia Dept of Conservation and Recreation- Division of Nat.
- **Tax ID:**
- **Street Address:** 217 Governor Street
- **City:** Richmond
- **State:** Virginia
- **ZIP Code:** 23219
- **Phone:** 804-786-6269
- **Fax:** 804-321-2674
- **Email:** danielle.kulas@dcr.virginia.gov
- **Comments:**

**File Attachments**
• Project number: give the project a unique, identifiable number for your reference that will be convenient for your reference if one is available

• Project name: give the project a title

• Project description: succinctly describe what work is proposed at the project site (e.g. residential subdivision)

• Site conditions: what are present conditions at the project site (e.g. rolling, intermittent drainage ways that form headwaters)

• Lat/long contact information: this information will be automatically populated by the application.

• Your email address should be where you will receive confirmation of project submittal and the project review report

• Submission Status: Automatically entered by the application.

• Comments: enter any other important information that DCR-DNH would need for proper review (e.g. this is a wetland compensation project, etc.)

11. File attachments such as photographs, survey documents, site plans, etc., can be uploaded and attached to the project form. Click “Choose File” to navigate to the file on your computer or network. When the correct file(s) is/are listed, click “Attach.”

12. Click “save” button at the bottom of the open window.

13. Once the project is submitted, all users will receive an email including a PDF report, listing Natural Heritage Screening Coverage features within 2 miles of the project boundary and a map showing the project location. This report will also be e-mailed to the DCR-DNH for review.
The project mapped as part of this report has been searched against the Department of Conservation and Recreation’s Natural Resources Data System for occurrences of natural heritage resources from the area indicated for this project. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in DCR’s files, NATURAL HERITAGE RESOURCES HAVE BEEN DOCUMENTED within two miles of the indicated project boundaries and/or POTENTIAL HABITAT FOR NATURAL HERITAGE RESOURCES intersect the project area.

You have submitted this project to DCR for a more detailed review for potential impacts to natural heritage resources. DCR will review the submitted project to identify the specific natural heritage resources in the vicinity of the proposed project. Using the expertise of our biologists, DCR will evaluate whether your specific project is likely to impact these resources, and if so how. DCR’s response will indicate whether any negative impacts are likely and, if so, make recommendations to avoid, minimize and/or mitigate these impacts. If no potential negative impacts are to species that are state- or federally-listed as threatened or endangered, DCR will also recommend coordination with the appropriate regulatory agencies: the Virginia Department of Game and Inland Fisheries for state-listed animals, the Virginia Department of Agriculture and Consumer Services for state-listed plants and insects, and the United States Fish and Wildlife Service for federally-listed plants and animals. If your project is expected to have positive impacts we will report those to you with recommendations for enhancing these benefits.

There will be a charge for this service for "for profit companies", $50, plus an additional charge of $50 for 1-5 occurrences and $50 for 6 or more occurrences.

Please allow up to 30 days for a response, unless you requested a priority response (in 5 business days) at an additional charge of $600. An invoice will be provided with your response.

We will review the project based on the information you included in the Project Info Submittal form, which is included in this report. Also any additional information including photographs, survey documents, etc. attached during the project submittal process and/or sent via email referencing the project title from the first page of this report.

Thank you for submitting your project for review to the Virginia Natural Heritage Program through the NH Data Explorer. Should you have any questions or concerns about DCR, the Data Explorer, or this report, please contact the Natural Heritage Project Review Unit at 804-371-7063.
14. If there are no resources within the search area, a “no find” letter will be e-mailed to the subscriber and no further correspondence will be received from VA Natural Heritage Program.

• **Add and edit polygon annotation to my map?**

Click on the Map Making tab and make sure any appropriate layers are turned on and that the map is zoomed to the area of interest. Click on the Polygons category and the polygon drawing options will display. Select desired fill style and color, transparency, and outline style, color, and thickness. (Note: if the chosen fill style is hashed then the option to choose color and transparency will go away). Once the necessary settings are in place, click on “Add Polygons.”
The Draw/Edit toolbar will appear:

Polygon annotation can be added by using the Get New Geometries From File button (shown right). See the How Do I Import a Shapefile to the map viewer section for more information regarding this option.

Polygon annotation can also be added by drawing directly to the map viewer. Click on the Draw New Geometries button (shown right) and draw the polygon by single-clicking on the map, making sure to click (or, put a vertex) at each direction change. Double click to finish the polygon shape.

Use the tools on the Draw/Edit toolbar to edit the newly-created shape.

- **Edit Geometries**: Click on the whole image to move or resize the polygon, or click on an individual vertex to alter or refine its shape.

- **Erase/Difference/Create Holes**: removes areas that are fully contained by the polygon
Crop/Intersect/Delete Outside Area: removes sections of the polygon; what lies outside the crop polygon gets deleted.

Buffer Geometries: enter a buffer distance and unit of measurement to buffer the polygon

Undo Last Drawing Change: undoes the last drawing action

Redo Next Drawing Change: redoes the last undo

Clear Drawn Geometries: deletes the shape

Draw Settings: pull-down gives the user the option to draw the polygon freehand (by holding and dragging the mouse over the map, rather than clicking individual points) and to disable navigation while drawing (locking the map in place so panning does not interfere with digitizing). Disable Navigation While Drawing is automatically checked.

When the polygon is done being drawn and edited, click “Accept” on the Draw/Edit toolbar. If at any point the user wants to go back and re-edit the polygon, click on “Edit Annotations” under the Annotation Layer Settings heading:
Then click on the annotation to be edited and make the appropriate adjustments. When finished, click “Stop Editing.”

- **Add and edit line annotation to my map?**
  Click on the Map Making tab and make sure any appropriate layers are turned on and that the map is zoomed to the area of interest. Click on the Line category and the line drawing options will display. Select desired line style and color, transparency, and line thickness. Once the necessary settings are in place, click on “Add Lines.”

The Draw/Edit toolbar will appear:
Line annotation can be added by using the Get New Geometries From File button (shown right). See the How Do I Import a Shapefile to the map viewer section for more information regarding this option.

Line annotation can also be added by drawing directly to the map viewer. Click on the Draw New Geometries button (shown right) and draw the line by single-clicking on the map, making sure to click-or put a vertex- at each direction change. Click twice to finish the line.

Use the tools on the Draw/Edit toolbar to edit the newly-created shape.

- **Edit Geometries**: Click somewhere on the line to move or resize it, or click and drag an individual vertex to alter or refine its shape.

- **Erase/Difference/Create Holes**: removes areas that are INSIDE the shape you delineate with the tool.

- **Crop/Intersect/Delete Outside Area**: removes sections of the line that lie OUTSIDE the shape you delineate with the tool.
Undo Last Drawing Change: undoes the last drawing action

Redo Next Drawing Change: redoes the last undo

Clear Drawn Geometries: deletes the shape

Draw Settings: pull-down gives the user the option to draw the line freehand (by holding and dragging the mouse over the map, rather than clicking individual points) and to disable navigation while drawing (locking the map in place so panning does not interfere with digitizing). Disable Navigation While Drawing is automatically checked.

When Drawing and Editing are complete, click “Accept” on the Draw/Edit toolbar. If at any point the user wants to go back and re-edit the line, click on “Edit Annotations” under the Annotation Layer Settings heading:

- Add and edit point annotation to my map?
  Click on the Map Making tab and make sure any appropriate layers are turned on and that the map is zoomed to the area of interest. Click on the Points category and the point drawing options will display. Select desired fill style and color, symbol size, transparency, outline color, and thickness. The “Fill Style” setting allows you to choose a symbol to represent the point location. Once the necessary settings are in place, click on “Add Points.”
The Draw/Edit toolbar will appear:

Point annotation can be added by using the “Get New Geometries From File” button (shown right). See the How Do I Import a Shapefile to the map viewer section for more information regarding this option.

Point annotation can also be added by drawing directly to the map viewer. Click on the “Draw New Geometries” button (shown right) and draw the point by single-clicking on the map. Note: only one point may be drawn during a given Draw/Edit session. You must click accept after the point is created and edited. Click “Add Points” again on the Map Making menu and go through the previous steps to make multiple point annotations.

Use the tools on the Draw/Edit toolbar to edit the newly created shape:

Edit Geometries: Click on the point to move it to a different location
Undo Last Drawing Change: undoes the last drawing action

Redo Next Drawing Change: redoes the last undo

Clear Drawn Geometries: deletes the shape

If you decide to remove points, click “Edit Annotations” in the Annotation Layer Settings. Click on the point to select it and choose “Delete Annotation” to remove it. When you’re done editing, click “Stop Editing.”

- Make a map with text labels?
  Click on the Map Making tab and make sure the map is zoomed to the area of interest and that any relevant layers are turned on. Click on the bottom Text category and “Text to Add” options will display. Enter your label text to add and adjust color, size, alignment, angle, style, or weight as necessary.
Click the “Add Text” button and then click on the map where the text should be located. Then click “Stop Adding Text” (the “Add Text” button changed to this when it was selected). If the text needs to be edited, choose to edit the annotation under Annotation Layer Settings. The options under that section will change accordingly:

Click on the annotation (i.e. label) to edit it, to drag it to a new location or to delete it by selecting “Delete Annotation.” The aforementioned variables under the “Text” section can also be changed (for example, Text Angle). Click “Stop Editing” when changes are complete. The Annotation Layer Settings window also gives the options to turn the entire Annotation Layer on or off by checking/unchecking the Visibility field as well as adjusting the layer’s transparency and clearing all annotations from the layer. When finished, the map is ready for printing.

**Print a map?**
Click the print button on the toolbar once the map viewer has the desired layers, scale, and/or annotations set.

The Print Map window will open; enter a Title, Author, and Copyright information into each field and click the blue arrow to the right of the blue “Print” button to select the proper print setting. Make sure your browser pop-up blocker is turned off, or the printable PDF may not open.

Click on the desired print setting and a PDF of the map will open in a new web browser tab for review. If the map is acceptable, use the PDF reader’s print function to print the map (note that there is also the option to save the map through the PDF reader as well). If changes need to be made to the map, exit the PDF preview and return to the map viewer to make the appropriate edits.
• Find a location of interest?
Find address or place tool:

Type a desired location, address or placename including state and/or zip code, in the text box. Hit “Enter” or click the “Find Location” magnifying glass icon to zoom to the location on the map. (The default map scale when searching on an address or place is 1:9028K; this scale is too large for the Terrain with Labels and Oceans basemaps to display. If either of these basemaps is being used, one must zoom out after searching to a scale of 1:72,224K).

Note: If searching for a commonly used name, be specific. The tool uses the search capability of Bing Placefinder, which is a global search. For example, when searching for Grafton, the user should specify Grafton, Virginia to avoid being taken to Grafton, North Dakota.

• Search for a certain feature in a layer?
Use the Find/Result tab to search data layers for features of interest. Below are several examples on how to use this tool.

Use Find/Results to pinpoint a specific location:
  - Find/Results on geographic place names
Click on the Find/Results tab and click on the blue arrow in the Resource field to open the drop-down menu of layers. Click on USGS Placenames layer name.

Type the location of interest in the Name field of the “By Attributes” section. Click Search.

The search results will appear below in the “Results” section of the Find/Results window. Check/Uncheck the appropriate boxes to select the location of interest and Click Zoom To. The Map will zoom to the selected location(s).
Find/results on Virginia county layer

Click on the Find/Results tab and click on the blue arrow in the Resource field to open the drop-down menu of layers. Click on the Counties layer name. Enter the County Name and Click Search.

The results will reveal the particular county, and clicking Zoom To will zoom to the extent of the selected county in the map viewer.
Use Find/Results to explore data layers

- Find out how many 1000-1200 acre Ecological Cores are within the Middle James – Buffalo watershed
This search requires that information is entered in the “By Attributes” and By Spatial” sections of the Find/Result tab. First, select Ecological Cores from the Resource pull-down menu. In the “By Attributes” section, enter the desired acreage range. In the “By Spatial” section, select “Features from Other Resource” in the Search By pull-down menu; this allows the user to search the Ecological Cores layer’s relationship to other layers (in this case, watersheds). In the “Resource” pull-down menu, click on “Watersheds”, and in the “Search Type” pull-down, click “Intersects”. Then click the Select from Resource button. Drag a box over the desired watershed on the map and click the “Search” button. Note that beside the search button, there is the option to show the spatial graphic (the watershed), which will become highlighted in blue in the map. The search results are highlighted in yellow and outlined in black.
Once the search is performed, the results section will automatically expand. Results details can be easily viewed by checking the plus sign next to each result, or by clicking on the Details button to open a details window. Click the “Flash” button to illuminate the selected results i.e. those checked) for a few seconds on the map viewer.

Click the “Table” button to open the results in tabular format. Clicking Print to PDF opens a PDF version of the table in a new web browser tab.

- **Search for Conserved Lands in a given County?**
  Click the Find/Results tab. Use the Resource pull-down arrow to select the Managed Conservation Lands layer. Click the “By Spatial” section to expand it. Use the pull-down menus to select the following:

  Search By: Features from Other Resources (features from another layer)
  Resource: Counties
  Search Type: Intersects
Once these search parameters are set, click “Select from Resource,” and click and drag a box on the county, or multiple localities of interest, which will be highlighted on the map.

Click “Search” and the Results section will populate with all Managed Conservation Lands that intersect the selected county (Hanover, in this example).
Select/Unselect individual results by clicking the check box next to the result. Expand result details by clicking on the plus sign next to a record:

Clicking details will open a details window in which the user can step between, Flash, and Zoom to the individual results on the map viewer.
Click Table to open the results in a tabular format. The user can still zoom to and flash selected results; a PDF of the results can also be generated for printing and saving by clicking the “Print To PDF” button.

<table>
<thead>
<tr>
<th>Management Name</th>
<th>Management Type</th>
<th>Management Agency</th>
<th>Owner</th>
<th>Management Level</th>
<th>Public Access</th>
<th>Total Acres</th>
<th>GIS Acres</th>
<th>Web Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashland Trolley Line</td>
<td>Local Park</td>
<td>Hanover County</td>
<td>Hanover County</td>
<td>Local</td>
<td>open</td>
<td>6.69</td>
<td>6.69</td>
<td>Link</td>
</tr>
<tr>
<td>Ashland Trolley Line</td>
<td>Local Park</td>
<td>Hanover County</td>
<td>Hanover County</td>
<td>Local</td>
<td>open</td>
<td>2.89</td>
<td>2.89</td>
<td>Link</td>
</tr>
<tr>
<td>Adlee Little League</td>
<td>Local Park</td>
<td>Hanover County</td>
<td>Hanover County</td>
<td>Local</td>
<td>open</td>
<td>52.35</td>
<td>52.35</td>
<td>Link</td>
</tr>
<tr>
<td>Capital Region Land</td>
<td>Conservation Easement</td>
<td>Capital Region Land Conservancy</td>
<td>Private</td>
<td>Private</td>
<td>closed</td>
<td>0</td>
<td>62.13</td>
<td>Link</td>
</tr>
<tr>
<td>Carter Park</td>
<td>Local Park</td>
<td>Hanover County</td>
<td>Hanover County</td>
<td>Local</td>
<td>open</td>
<td>10.97</td>
<td>10.97</td>
<td>Link</td>
</tr>
<tr>
<td>Cold Harbor</td>
<td>Local Battlefield Park</td>
<td>Hanover County</td>
<td>Hanover County</td>
<td>Local</td>
<td>open</td>
<td>50</td>
<td>64.94</td>
<td>Link</td>
</tr>
</tbody>
</table>

The results are highlighted on the map viewer (graphic below).
Note that some highlighted Conserved Lands fall outside the search county of Hanover (in Henrico, the county south of Hanover). This is because either they are part of the same conserved entity (for example, Richmond National Battlefield Park accounts for many of those scattered highlighted polygons), or they are adjacent to the county and got selected because the managed area crosses county boundaries. Another search type, “Contains,” will return Conserved Lands that fall completely within the selected county, excluding conserved lands that overlap into more than one county:
• Access an outside map service for use in the map viewer?
  Click the “Add Resource” tool in the upper left corner of the map viewer (in red, below).

In the Add Resource dialog, type the URL of the map service to add, and give it a title. The URL of the map service should be in the following format: https://<your server>/arcgis/rest/services/<service name>/MapServer. See example below.

Click the “Add Mapservice” button. You will see the following warning message:

Click ‘Yes.’ If the browser blocks an insecure service, as described in the message above, you will receive either of the following errors (left if you are using Firefox and right if you are using Chrome):
Follow the instructions in the latter part of the warning message (underlined in red) by clicking the appropriate shield in the respective browser and disabling protection.

**Firefox:**

Follow the instructions in the latter part of the warning message (underlined in red) by clicking the appropriate shield in the respective browser and disabling protection.

**Chrome:**

Follow the instructions in the latter part of the warning message (underlined in red) by clicking the appropriate shield in the respective browser and disabling protection.

Once you click ‘disable protection’ in Firefox or ‘load unsafe script’ in Chrome you must click “Add Resource” again and go through the initial steps for adding a mapservice, described in the beginning of these instructions.

Once the mapservice has been added to the map viewer, an “Added Resources” heading will appear in the layers tab above other map NHDE layers, with the newly added mapservice. Hover to the right of the added layer to reveal a down arrow. Click this arrow for options to change the layer’s transparency, move the layer up and down within other added resources, zoom to the layer, remove the layer, or view its mapservice details.
• **Import a shapefile to the map viewer?**  
To import a shapefile to the map viewer, access the “Get New Geometries from File” button through one of the following two ways.

For subscribers:

![Draw/Edit toolbar](image)

Click the Submit Project button to open a Draw/Edit toolbar in which the “Get New Geometries from File” button can be located (in red box, below). Note that this function through Submit Project only supports polygon geometry.

For any users:
The Map Making tab also opens a Draw/Edit toolbar containing the “Get New Geometries from File” button (in red box, above). Choose to add points, lines, or polygons depending on user mapping needs (polygons are used in the example below).

![Map Making tab](image)

In the Draw/Edit toolbar that opens, select the “Get New Geometries From File” button (left).

When accessing this button (whether through the Map Making tab or the Submit Project tool), the following window will appear, giving further instructions for upload:

![Upload Shapes window](image)
Navigate to the zipped file and click “select file to upload.” The map will automatically zoom to the location of the newly added shapefile. The type must match the current drawing type; (if adding line annotation, upload a file with line geometry, if adding polygon annotation or project boundary, upload a file with polygon geometry.) Click “Accept” on the draw/edit toolbar to save the shapefile to the map view, or click “Cancel” to cancel. It does not matter what projection the shapefile is in, however, in order to successfully upload a shapefile, it must have a defined projection (a .prj file).

Note: if uploading a shapefile with more than one feature, the following message will appear:

One of the shapes must be selected or the multi-feature file cannot be uploaded (more than one shape cannot be selected).

- **Get help through NHDE support?**
  Contact NHDE support at [nhdesupport@dcr.virginia.gov](mailto:nhdesupport@dcr.virginia.gov). Please screen capture any error messages so it can be sent electronically to DCR-DNH.
Frequently Asked Questions

- **What happened to LCDE website and how does it relate to NHDE?**
  What was formerly known as Land Conservation Data Explorer, an online GIS mapping application to allow searching and display of Virginia’s conservation lands database, is now part of the Natural Heritage Data Explorer. The same ability to view and query Virginia land conservation information is available via the Find/Results function in the new NHDE, when using the Managed Conservation Lands and Conservation Planning layers.

- **Why did I get automatically logged out of my session?**
  The website times out for security reasons after 30 minutes of the user being idle.

- **Why can’t I input a specified view scale and zoom to it in the new site?**
  Due to the way basemaps are defined in web services, there are a set number of scales that it is possible to view, which are standardized across the various available basemaps. Offering many more, or all possible scales for viewing would greatly reduce the speed and performance of the site.

- **How long will it take for me to receive my automated report?**
  Report PDFs are generated in batch files and it may take up to two minutes for the user to receive the report after submittal.

- **How long does it take to receive a full response to my project submitted through NHDE?**
  For any and all submitted projects, the user will receive an emailed response with summary PDF report of findings within 2 minutes. When there are Natural Heritage resources within 2 miles of the project boundary, or an intersect with a predictive model, it can take up to 30 calendar days for DCR-Natural Heritage project review staff to respond in writing, with full site-specific recommendations and considerations for the activities associated with the project.

- **Why doesn’t NHDE save my Spatial Bookmarks or Map Annotations?**
  Unfortunately, these are only saved within a user’s session. Logging out or timing out of a session will clear these settings.

- **Why am I receiving errors when trying to add a mapservice to the map viewer?**
  Web browser security in Firefox and Chrome blocks the addition of insecure mapservices; see the “how do I” section (specifically, how do I access an outside mapservice for use in the map viewer) for steps to load map content in insecure mode.
The **Species/Community Search** tool allows the user to search the Virginia Natural Heritage Program’s database for summary information about rare species and natural communities. Searchable attributes include Taxonomic Group, Global and State Conservation Status Rank, Federal and State Legal Status, County, Physiographic Province, Watershed, and Subwatershed. Tabular PDF reports may be generated for printing or saving.

For more background information about this tool, visit the Natural Heritage Program’s [Search Our Database](#) web page. The **Species/Community Search** tool webpage also contains useful tips for streamlining and refining searches. For more detailed search help and useful example searches, visit Natural Heritage’s [Search Tips](#) webpage.

### Definitions of Abbreviations used on Natural Heritage Resource Lists

The following ranks are used by the Virginia Department of Conservation and Recreation to set protection priorities for natural heritage resources. Natural Heritage Resources, or "NHRs," are rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The criterion for ranking NHRs is the number of populations or occurrences, i.e. the number of known distinct localities; the number of individuals in existence at each locality or, if a highly mobile organism (e.g., sea turtles, many birds, and butterflies), the total number of individuals; the quality of the occurrences, the number of protected occurrences; and threats.

- **S1** - Critically imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state. Typically 5 or fewer populations or occurrences; or very few remaining individuals (<1000).
- **S2** - Imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. Typically 6 to 20 populations or occurrences or few remaining individuals (1,000 to 3,000).
- **S3** - Vulnerable in the state either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 100 populations or occurrences (1,000 to 3,000).
- **S4** - Apparently secure; Uncommon but not rare, and usually widespread in the state. Possible cause of long-term concern. Usually >100 populations or occurrences and more than 10,000 individuals.
- **S5** - Secure; Common, widespread and abundant in the state. Essentially ineradicable under present conditions. Typically with considerably more than 100 populations or occurrences and more than 10,000 individuals.
- **S#B** - Breeding status of an animal within the state
- **S#N** - Non-breeding status of animal within the state. Usually applied to winter resident species.
- **S#?** - Inexact or uncertain numeric rank.
- **SH** - Possibly extirpated (Historical). Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.
- **SH#S#** - Range rank; A numeric range rank, (e.g. S2S3) is used to indicate the range of uncertainty about the exact status of the element. Ranges cannot skip more than one rank.
- **SU** - Unrankable; Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
- **SNR** - Unranked; state rank not yet assessed.
- **SX** - Presumed extirpated from the state. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
- **SNA** - A conservation status rank is not applicable because the element is not a suitable target for conservation activities.
Global Ranks are similar, but refer to a species' rarity throughout its total range. Global ranks are denoted with a "G" followed by a character. Note GX means the element is presumed extinct throughout its range, not relocated despite intensive searches of historical sites/appropriate habitat, and virtually no likelihood that it will be rediscovered. A "Q" in a rank indicates that a taxonomic question concerning that species exists. Ranks for subspecies are denoted with a "T". The global and state ranks combined (e.g. G2/S1) give an instant grasp of a species' known rarity.

The ranks above should not be interpreted as legal designations.

**FEDERAL STATUS**

The Division of Natural Heritage uses the standard abbreviations for Federal endangerment developed by the U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation.

- **LE** - Listed Endangered
- **LT** - Listed Threatened
- **PE** - Proposed Endangered
- **PT** - Proposed Threatened
- **C** - Candidate (formerly C1 - Candidate category 1)
- **E(S/A)** - treat as endangered because of similarity of appearance
- **T(S/A)** - treat as threatened because of similarity of appearance
- **SOC** - Species of Concern

**STATE LEGAL STATUS**

The Division of Natural Heritage uses similar abbreviations for State endangerment:

- **LE** - Listed Endangered
- **PE** - Proposed Endangered
- **SC** - Special Concern - animals that merit special concern according to VDGIF (not a regulatory category)
- **LT** - Listed Threatened
- **PT** - Proposed Threatened
- **C** - Candidate

For information on the laws pertaining to threatened or endangered species, please contact:

U.S. Fish and Wildlife Service for all Federally listed species;
Department of Agriculture and Consumer Services, Plant Protection Bureau for State listed plants and insects
Department of Game and Inland Fisheries for all other State listed animals

**CONSERVATION SITES RANKING**

B-rank is a rating of the significance of the conservation site based on presence and number of natural heritage resources; on a scale of 1-5, 1 being most significant. Sites are also coded to reflect the presence/absence of federally/state listed species:

<table>
<thead>
<tr>
<th>Conservation Site Ranks</th>
<th>Legal Status of Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1 - Outstanding significance</td>
<td>FL – Federally listed species present</td>
</tr>
<tr>
<td>B2 - Very High significance</td>
<td>SL – State listed species present</td>
</tr>
<tr>
<td>B3 - High significance</td>
<td>NL – No listed species present</td>
</tr>
<tr>
<td>B4 - Moderate significance</td>
<td></td>
</tr>
<tr>
<td>B5 - Of general Biodiversity significance</td>
<td></td>
</tr>
</tbody>
</table>