



Tutorial for using the CNDDDB layer in the BIOS 5 “CNDDDB & Spotted Owl Viewer”



California Department of Fish and Wildlife
California Natural Diversity Database
April 2020

The [CNDDDB & Spotted Owl Data Viewer](#) is a BIOS bookmark that opens the BIOS 5 viewer with California Natural Diversity Database (CNDDDB) and Spotted Owl Database data preloaded for you. Using BIOS, you may view CNDDDB data spatially, add labels, and print maps without the need to have GIS software installed on your computer. More complex spatial analysis and data manipulation will still require the use of a full GIS in conjunction with RareFind.

Additional BIOS data viewer support is also available in the [BIOS User Guide](#) and the [BIOS Frequently Asked Questions](#).

Contents

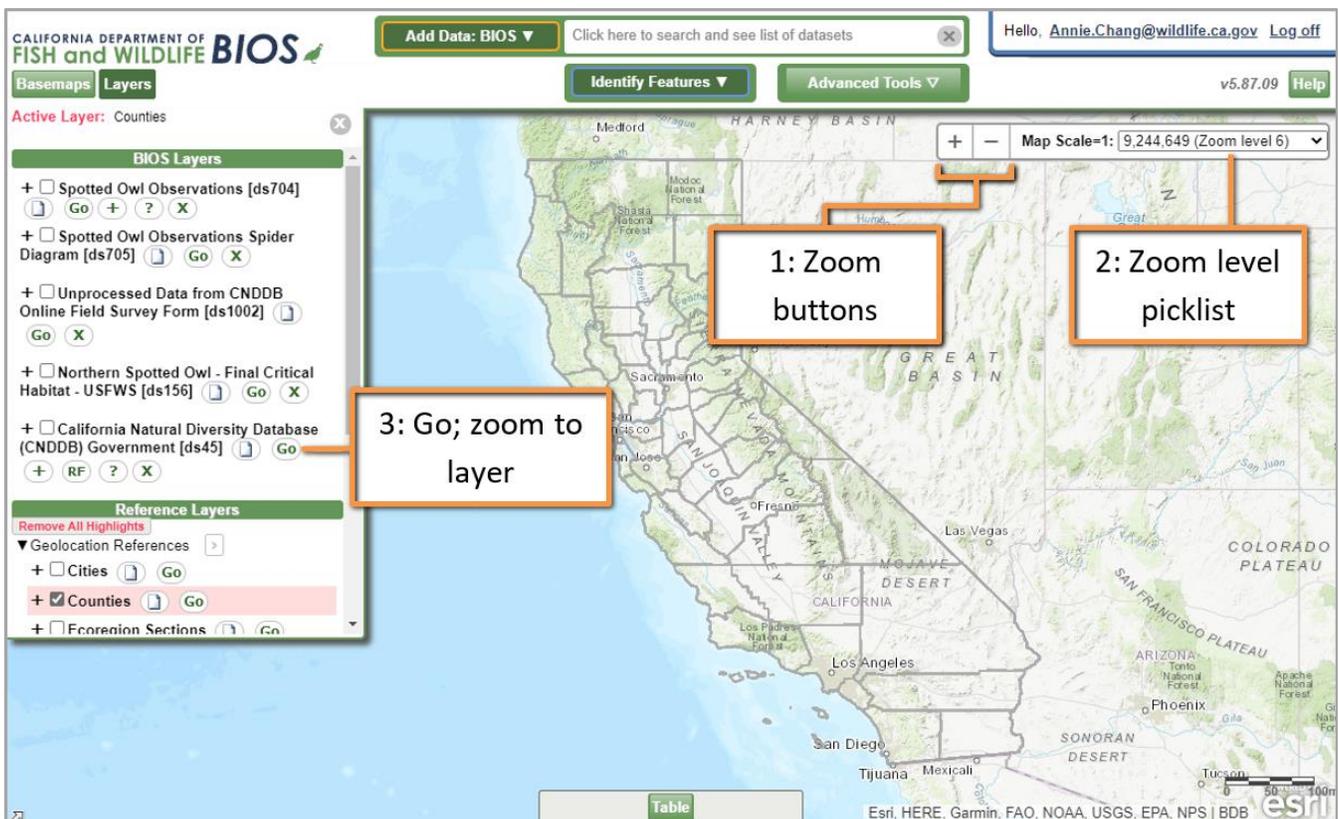
Navigating.....	2
Adding Layers	3
Displaying Layers.....	4
Activating a Layer.....	5
Identifying Features	6
Filtering Element Occurrences.....	7
Instant Filter.....	7
Layer Filter	8
Selecting Element Occurrences	9
Selecting EOs – spatial selection	9
Selecting EOs – query selection.....	10
Using Selected Features.....	11
Reports	12
Export Selected Records From BIOS to RareFind	13
Export Selected Records From RareFind to BIOS	14
Create PDF of Map & Data.....	16
Appendix 1: Operator Descriptions for Query Builder & Layer Filter.....	18

Navigating

Navigation in BIOS 5 viewer is achieved with the mouse or keyboard. You can pan the map in any direction by a simple click and drag.

To zoom in or out:

- Scroll the mouse wheel
- Hold Shift on your keyboard + click-and-drag with your mouse to form a box and zoom to that box's area (Ctrl + Shift + click-and-drag zooms out)
- Use the "+" and "-" keys on the keyboard
- Double-click to zoom in
- Press the "+" or "-" buttons on the map [1]
- If there is a particular reference scale you prefer, you can quickly select a scale from the Map Scale pick list [2]. When the zoom level is at 15 or greater, the CNDDDB Element Occurrences are labeled with scientific name.
- Click "Go" next to a layer to zoom to the data in that layer [3]



Adding Layers

The CNDDDB & Spotted Owl Viewer bookmark comes preloaded with the following data sets in the BIOS Layers portion of the Table of Contents [4]:

- CNDDDB (ds45 or ds85)
- Unprocessed Data from CNDDDB Online Field Survey Form (ds1002)
- Spotted Owl Observations (ds704)
- SPOW Obs Spider Diagram (ds705)
- N. SPOW – Critical Habitat (ds156)



Additionally, the BIOS viewer has several Reference Layers [5] preloaded in the Table of Contents. The viewer also allows the use of additional biogeographic data layers in conjunction with the CNDDDB data layer. The “Add Data: BIOS” button [6] can be used to add other BIOS data layers, such as Critical Habitat layers, vegetation, and other species data layers. More information about the BIOS tools is available under the “Help” button [7].

Displaying Layers

Click the checkbox of each layer that you want displayed [8]. It helps to zoom in when displaying the CNDDDB data to avoid long drawing times. The symbology associated with a data set can be expanded in the Table of Contents by clicking the “+” to the left of the layer title [9].

The screenshot shows the BIOS Layers panel with the following layers and their symbology:

- Spotted Owl Observations [ds704]
- Spotted Owl Observations Spider Diagram [ds705]
- Unprocessed Data from CNDDDB Online Field Survey Form [ds1002]
- Northern Spotted Owl - Final Critical Habitat - USFWS [ds156]
- California Natural Diversity Database (CNDDDB) Government [ds45]

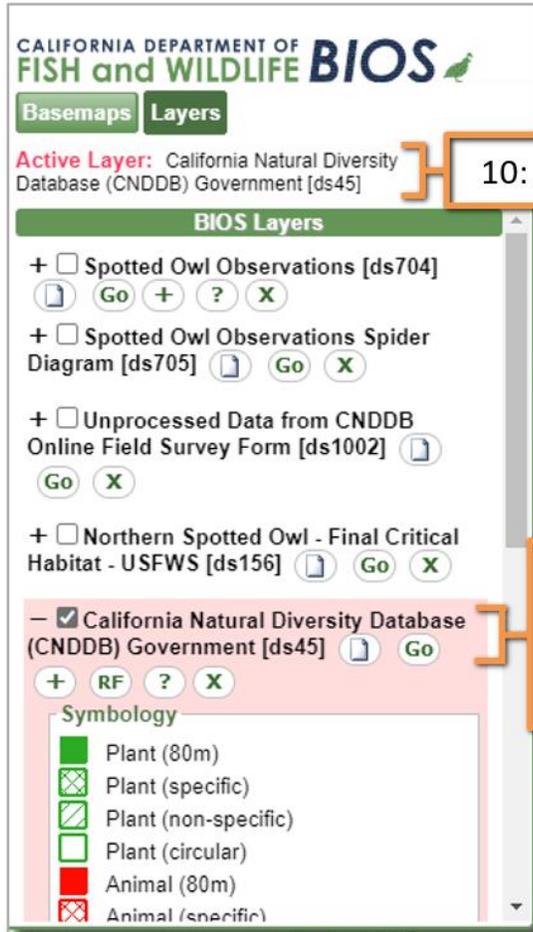
The symbology for the active layer (California Natural Diversity Database) is expanded and includes:

- Plant (80m)
- Plant (specific)
- Plant (non-specific)
- Plant (circular)
- Animal (80m)
- Animal (specific)

Annotations in the image point to the checkboxes for layer visibility (8) and the expand/collapse symbols for the symbology legend (9).

Activating a Layer

Tools in BIOS that interact with data layers only work on the “Active Layer.” Only one layer at a time can be active. You may check the Active layer display at the top of the Table of Contents to see which layer is active [10]. To make a layer active, simply click on the name of a layer [11]. You will see a pink box appear around the layer indicating it is active, and the name of the layer will show in the Active Layer display above the Table of Contents.



The screenshot shows the BIOS interface with the 'Layers' tab selected. At the top, it says 'Active Layer: California Natural Diversity Database (CNDDDB) Government [ds45]'. Below this is a list of layers under the heading 'BIOS Layers'. The 'California Natural Diversity Database (CNDDDB) Government [ds45]' layer is checked and highlighted with a pink background. A callout box labeled '10: Active Layer' points to the active layer text. Another callout box labeled '11: Click layer name to make active; active layer is pink' points to the layer name in the list. The active layer's symbology is shown below, including categories for Plant (80m), Plant (specific), Plant (non-specific), Plant (circular), Animal (80m), and Animal (specific).

10: Active Layer

11: Click layer name to make active; active layer is pink

Identifying Features

Click on the layer name you are interested in to make it the Active Layer. From the Map Tools menu [12], select “Identify Features” to get additional information about occurrences by activating (clicking) the tool and then clicking the feature of interest (layer must be Active Layer). The features you click on will highlight in blue [13] and a table will expand from the bottom and return the attributes of the identified feature(s) [14].

The screenshot shows the BIOS web application interface. The top navigation bar includes the BIOS logo, a search bar, and user information. The left sidebar contains a list of layers, with the California Natural Diversity Database (CNDDDB) Government [ds45] selected as the Active Layer. The main map area displays a map of California with several red circular markers. One marker is highlighted in blue. A dropdown menu is open over the map, showing options like Identify Features, Point Info, Measure, Add Label, and Select... The bottom of the interface shows a table of identified features.

12: Map Tools menu

13: Highlighted feature(s)

14: Results table

Zoom	Scientific Name	Common Name	Element Code	Occ Number	MAPNDX	EONDX	Key Quad Code	Key Quad Name	Key County Code	Accur
1	Siphateles bicolor thalassinus	Goose Lake tui chub	AFCJB1303Q	1	17165	9711	4112084	West of Willow Ranch	MOD	nonspeci
2	Larus californicus	California gull	ABNNM03110	2	17165	4944	4112084	West of Willow Ranch	MOD	nonspeci
3	Entosphenus tridentatus ssp. 1	Goose Lake lamprey	AFBAA02101	1	17165	9714	4112084	West of Willow Ranch	MOD	nonspeci
4	Plegadis chihi	white-faced ibis	ABNGE02020	11	17165	6068	4112084	West of Willow Ranch	MOD	nonspeci

Filtering Element Occurrences

One of the most requested feature enhancements by CNDDDB subscribers using BIOS to view the CNDDDB Element Occurrences has been the ability to view subsets or only a specific portion of the CNDDDB data. This may be helpful to make maps clearer to understand where there are many CNDDDB occurrences. For example, one map may be filtered to show only plants, and another map to show only animals for the same location. This ability is now available in the Layer Filter tools under the Advanced Tools menu. Currently there is the easy-to-use Instant Filter and the more advanced Layer Filter.

Instant Filter

With the CNDDDB layer set as the Active Layer, expand the Advanced Tools menu [15] and then select Layer Filter. By default, the Instant Filter tab [16] will be selected, which allows you to easily filter the CNDDDB occurrences to view a particular suite of species. The “DEF” next to the predefined filter expands and displays the definition query used to filter the data layer. Understanding the syntax of these definition queries may be helpful in creating a more custom filter under the Layer Filter tab of the Layer Filter window. Note that a filter icon [17] shows up next to the filtered layer in the Table of Contents. Hovering over the filter icon displays the filter definition query; clicking the filter icon opens the Layer Filter tool to allow you to change or remove the filter.

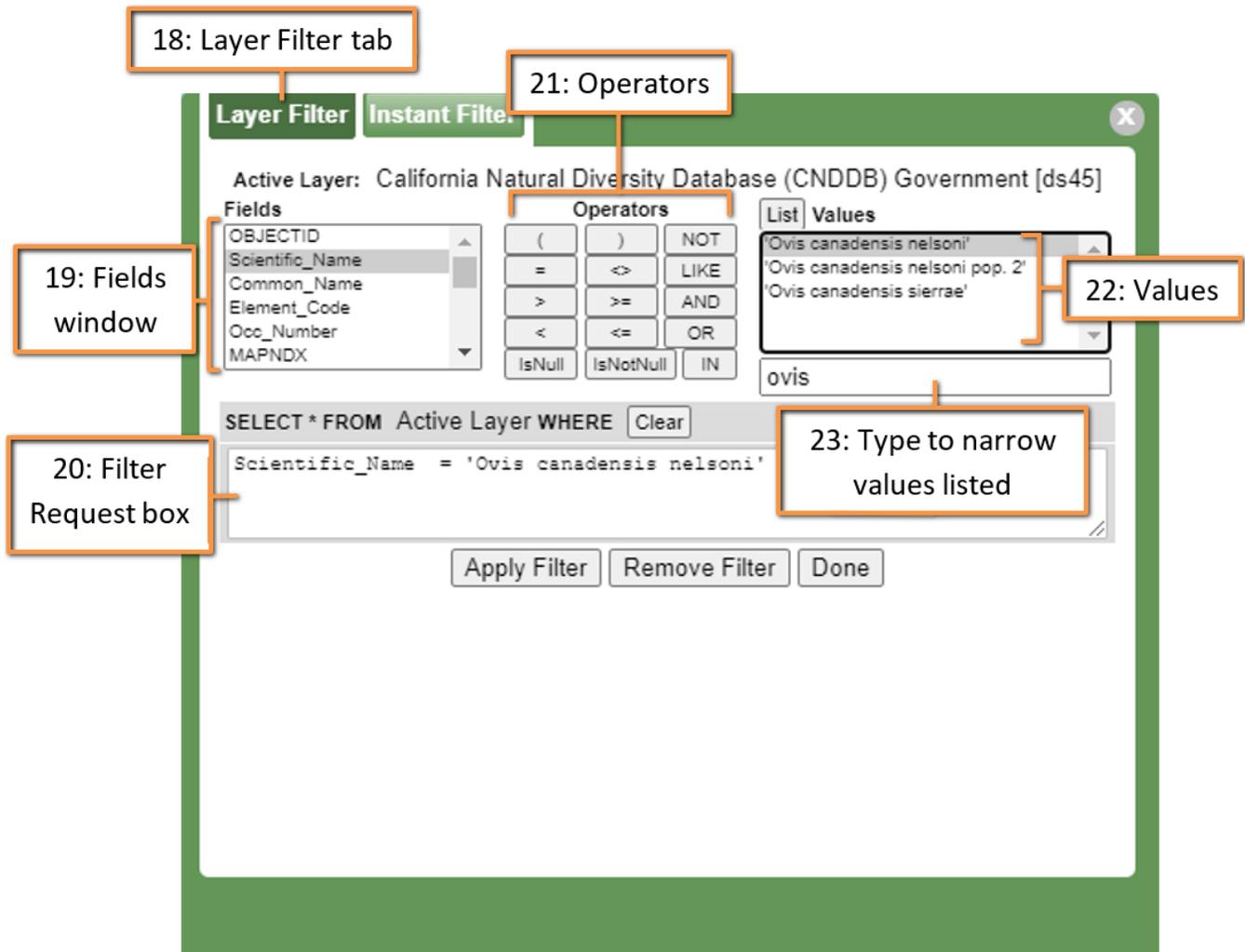
15: Advanced Tools menu

16: Instant Filter tab

17: Filter icon

Layer Filter

With the CNDDDB layer set as the Active Layer, navigate to the Layer Filter window (Advanced Tools -> Layer Filter) and click the Layer Filter tab [18]. Here you can create a custom filter based on the attribute fields of the CNDDDB data layer. The “Fields” window [19] shows all of the fields in the Active Layer. These are the fields that you can choose from to build a query. Double-click on a field name in the list to add that field to the Filter Request box at the bottom [20] where you will build the query command. A single click on one of the “Operators” [21] will add it to the Filter Request box. It may be useful to review the Operator definitions and descriptions in [Appendix 1](#). Clicking the “List” button will list the values [22] for a field. Double-click on a field value to add it to the Filter Request box. You can also manually enter a value to narrow your list values [23] and pressing the Enter key on your keyboard. The “Filter Request” box [20] shows the query that will execute when you click on the "Apply Filter" button. This filter is defined by clicking on items in the Fields, Operators, and Values areas above.



A filter can be constructed to show a specific subset of the CNDDDB data layer, or to exclude a portion of the data for display purposes (note: CNDDDB recommends that all CNDDDB-tracked species be considered during environmental review and not excluded from analysis). The Layer

Filter only limits what occurrences are displayed in the BIOS 5 viewer. The next section covers Select tools, which provide additional reporting and exporting tools.

Selecting Element Occurrences

CNDDDB Element Occurrence features can be selected either spatially in the map viewer or through a specific query selection. The spatial selection is useful for selecting all the occurrences in a particular area, whereas the query selection allows a selection through attributes (for examples, you may use the query selection to select federally endangered birds). To select occurrences from the CNDDDB layer, please make sure the CNDDDB layer is set as the Active Layer.

Selecting EOs – spatial selection

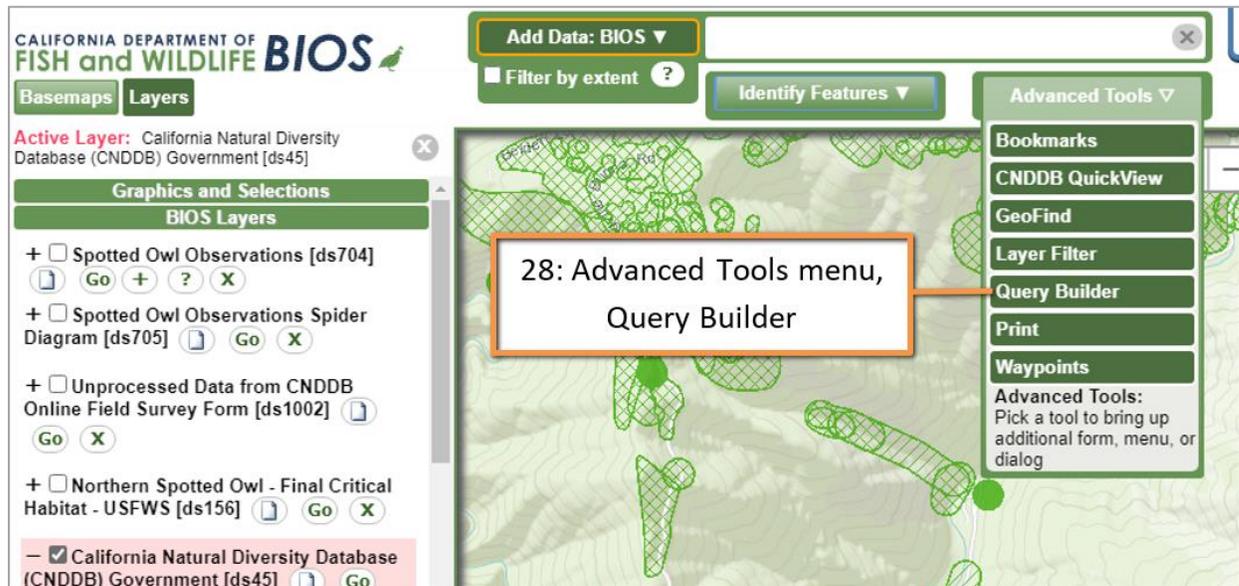
If you want information on a group of occurrences in the same general area, click the Map Tools menu [24] and choose “Select...” Three spatial selection methods are available [25]: click-and-drag rectangular box selection, click to draw a polygon of selection, and point buffer selection. All three selection methods will select any Element Occurrence that the drawn shape touches; they do not have to completely enclose the occurrence. Once the selection is made, the selected occurrence will be highlighted [26] in the BIOS map viewer and a table at the bottom of the map viewer will display the details of the selected records [27].

The screenshot shows the BIOS 5 web application interface. At the top, there is a navigation bar with the logo for the California Department of Fish and Wildlife BIOS. Below the logo, there are buttons for 'Add Data: BIOS', 'Filter by extent', 'Select...', and 'Advanced Tools'. The main map area displays a map of a region with several yellow and orange markers representing element occurrences. A red polygon is drawn around a cluster of these markers, indicating a selection. On the right side, there is a 'Select features from' panel with options for 'Method' (Rectangle, Polygon, Point Buffer) and 'Operation' (New Selection, Select from Set). At the bottom, a 'Table' displays the details of the selected records.

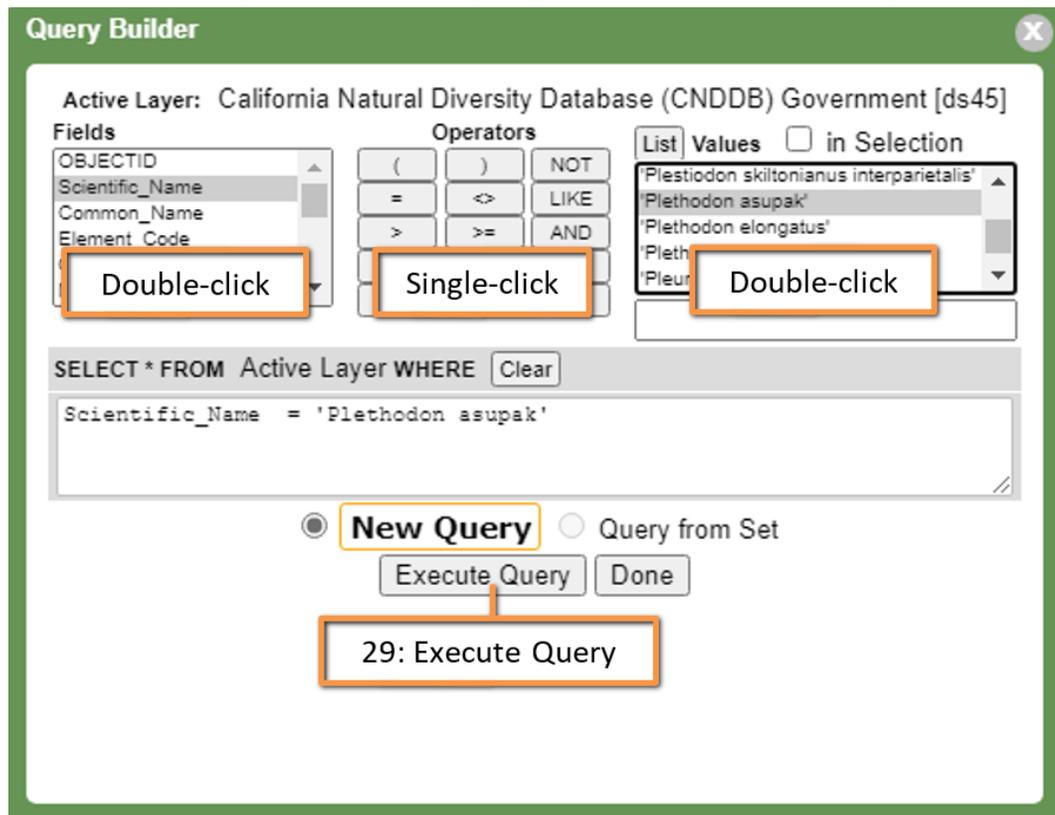
Zoom	Scientific Name	Common Name	Element Code	Occ Number	MAPNOX	ECNOX	Key_Quad_Code	Key_Quad_Name	Key_County_Code	Accuracy	Pres
1	Go <i>Lewisia carnelovii</i>	Carnelov's lewisia	PDPOR04020	23	11924	21441	4012112	Caribou	PLU	80 meters	Presum
2	Go <i>Sedum albomarginatum</i>	Feather River stonecrop	PDCRA0A030	15	30478	18867	4012112	Caribou	PLU	specific area	Presum
3	Go <i>Packera eurycephala</i> var. <i>lewisrosei</i>	Lewis Rose's ragwort	PDAST8H182	2	30167	22833	4012112	Caribou	PLU	specific area	Presum
4	Go <i>Frangula purshiana</i> ssp. <i>ultramafica</i>	Caribou coffeeberry	PDRHA0H061	29	A0258	101822	4012112	Caribou	PLU	specific area	Presum
5	Go <i>Sedum albomarginatum</i>	Feather River stonecrop	PDCRA0A030	18	30477	4129	4012112	Caribou	PLU	nonspecific area	Presum

Selecting EOs – query selection

You can also select features based upon their attributes by using the Query Builder. Expand the Advanced Tools menu [28] and then select Query Builder. When you click on this tool, the Query Builder window opens.



The Query Builder looks just like the [Layer Filter](#); double-click an attribute in the “Fields” column, choose (single click) an Operator (descriptions in [Appendix 1](#)), and then scroll to and double-click (or type in) a Value. Note: typed values must exactly match the listed values. In the example here, the query will search for features that have a Scientific Name of *Plethodon asupak*. To run the query, click the “Execute Query” button [29].



Using Selected Features

Once you've made a selection, either spatially or with the Query Builder, all of the selected features will be highlighted [30]. To zoom to the selected features, click and expand the Graphics and Selections portion of the Table of Contents [31] and click the "Go" button next to the layer selection. A limited amount of text data on each occurrence record is displayed at the bottom of the screen in the table. The "Table" button [32] located at the top center of the table will expand or minimize the table. The table can be further expanded using the triangle button at the top right side of the table [33]. The table can also be minimized by clicking "X" button at the top right of the table [34]. For easier viewing of the tabular records, the "Print Preview" button [35] will open a new, larger window with all of the tabular information that is shown at the bottom of the main screen. You may choose to export the table into Excel by using the "Export" button [36]. If you want to clear the current selection, click the "X" button [37] next the layer selection in the Table of Contents (Note: clicking the "X" icon next to the CNDDDB layer name under BIOS Layers will remove the CNDDDB layer).

The screenshot displays the BIOS web application interface. At the top, there is a navigation bar with 'Add Data: BIOS', a user profile for Annie.Chang@wildlife.ca.gov, and a version number of v5.87.09. The main area is divided into a map and a table. The map shows a topographic view of a region with several red circles highlighting specific features. The table at the bottom lists occurrence records for the species Plethodon asupak. Callouts with orange boxes and lines point to various UI elements: 31 points to the 'Graphics and Selections' section in the Table of Contents; 37 points to the 'X' button next to the layer selection; 30 points to a red circle on the map; 33 points to a triangle icon in the table header; 36 points to the 'Export' button; 35 points to the 'Print Preview' button; 32 points to the 'Table' button; and 34 points to the 'X' button in the table header.

Zoom	Scientific Name	Common Name	Element Code	Occ. Number	MAPNDX	EONDX	Key_Quad Code	Key_Quad Name	Key_County_Code	Accuracy	Presence	Occ
1	Plethodon asupak	Scott Bar salamander	AAAAD12560	9	88738	89215	4112268	Russell Peak	SIS	specific area	Presumed Extant	Natural/Nath
2	Plethodon asupak	Scott Bar salamander	AAAAD12560	39	88857	89867	4112361	Scott Bar	SIS			/Nath
3	Plethodon asupak	Scott Bar salamander	AAAAD12560	41	88862	89872	4112361	Scott Bar	SIS			/Nath
4	Plethodon asupak	Scott Bar salamander	AAAAD12560	42	88863	89874	4112361	Scott Bar	SIS			/Nath
5	Plethodon asupak	Scott Bar salamander	AAAAD12560	20	50459	50459	4112362	Grider Valley	SIS	nonspecific area	Presumed Extant	Natural/Nath

Reports

After Element Occurrence records are selected from the CNDDDB layer, an Element Occurrence Report can be generated. To generate a report, go to the “+” button (Additional Options) next to the layer name in either the Graphics and Selections or BIOS Layers sections of the Table of Contents [38]. The report will generate for the selected occurrences regardless of which Additional Options button you press. A Special Functions window pane [39] in the right portion of the map viewer will open up. Click “Occurrence Report” [40]. A small window will pop-up [41] and notify you that the report is being generated and to wait a little bit. Open your report and then close the pop-up window. Additional report formats and tabular data exports are available using [RareFind 5](#).

The screenshot displays the BIOS web application interface. The top navigation bar includes the logo for the California Department of Fish and Wildlife BIOS, a search bar, and user information for Annie.Chang@wildlife.ca.gov. The main interface is divided into several sections: Graphics and Selections, BIOS Layers, Reference Layers, and Special Functions. The map viewer shows a topographic map with several red circles highlighting specific locations. A callout box labeled '38: Additional Options' points to the '+' button in the BIOS Layers section. Another callout box labeled '39: Special Functions window' points to the Special Functions pane on the right. A third callout box labeled '40: Run report' points to the 'Full Report with Sources' button in the Special Functions pane. Below the map, a table displays the selected features, with 42 features selected. The table columns include Zoom, Scientific Name, Common Name, Element Code, Occ Number, MAPNDX, EONDX, Key_Quad_Code, Key_Quad_Name, Key_County_Code, Accuracy, Presence, and Occ.

Zoom	Scientific Name	Common Name	Element Code	Occ Number	MAPNDX	EONDX	Key_Quad_Code	Key_Quad_Name	Key_County_Code	Accuracy	Presence	Occ
1	Plethodon asupak	Scott Bar salamander	AAAAAD12560	8	68729	69205	4112278	Horse Creek	SIS	specific area	Presumed Extant	Natural/Nath
2	Plethodon asupak	Scott Bar salamander	AAAAAD12560	19	50458	50458	4112362	Grider Valley	SIS	1/10 mile	Presumed Extant	Natural/Nath
3	Plethodon asupak	Scott Bar salamander	AAAAAD12560	22	50461	50461	4112361	Scott Bar	SIS	1/10 mile	Presumed Extant	Natural/Nath
4	Plethodon asupak	Scott Bar salamander	AAAAAD12560	23	50463	50463	4112361	Scott Bar	SIS	1/10 mile	Presumed Extant	Natural/Nath
5	Plethodon asupak	Scott Bar salamander	AAAAAD12560	26	50467	50467	4112361	Scott Bar	SIS	1/10 mile	Presumed Extant	Natural/Nath

The screenshot shows a pop-up window titled 'BIOS Report' with the URL https://apps.wildlife.ca.gov/bios/c... The window contains the BIOS logo and a message: 'Generating Report. Please wait for the server to generate the PDF report for download. This process should take less than a minute. Close this window after the PDF has been downloaded.' A callout box labeled '41: Pop-up window' points to the message area.

Export Selected Records From BIOS to RareFind

For further analysis of occurrence details or reporting functions, a selected set of Element Occurrences from the CNDDDB layer in BIOS can be exported to RareFind. Click the “RF” button [42] next to the CNDDDB layer either from the Graphics and Selections portion of the Table of Contents or the BIOS Layers section of the Table of Contents. This will open RareFind in a new browser window [43] with the selected records loaded. If RareFind is already open in a different browser window, RareFind will refresh with your BIOS selection. Please allow pop-ups if alerted.

The screenshot shows the BIOS web interface. On the left, under the 'BIOS Layers' section, there is a list of layers. The first layer is 'California Natural Diversity Database (CNDDDB) Government [ds45]'. Below this layer, there are several buttons: 'T', '+', 'RF', and 'X'. The 'RF' button is highlighted with an orange box and a callout that says '42: Open RareFind'. To the right of the interface is a map showing various geographical features and data points.

The screenshot shows the RareFind web interface. At the top, there is a navigation bar with tabs for 'Query', 'Results', 'Occurrence Details', 'Reports', 'BIOS', 'Export/Import', and 'Help'. The 'Results' tab is active. Below the navigation bar, there is a table of search results. The table has columns for 'Image Search', 'Scientific Name', 'Common Name', 'Taxonomic Group', 'Element Code', 'Total Occs', 'Returned Occs', 'Federal Status', 'State Status', and 'Global Rank'. The first row of data is for 'Plethodon asupak', with a common name of 'Scott Bar salamander' and 42 total occurrences. Below the table, there is a section for 'Occurrences by Selected Element' which shows a detailed list of occurrences for 'PLETHODON ASUPAK'.

Occ Number	EOn dx	Date Element Last Seen	Date Site Last Seen	Presence	Accuracy	County	Quad
<input type="checkbox"/> 1	64022	2006-12-12	2006-12-12	Presumed Extant	Specific bounded area with an 80 meter radius	Siskiyou	Horse Creek (4112278), 1
<input type="checkbox"/> 2	64027	2006-04-10	2006-04-10	Presumed Extant	Specific bounded area	Siskiyou	Russell Peak (4112268)
<input type="checkbox"/> 3	64038	2012-04-18	2012-04-18	Presumed Extant	Specific bounded area	Siskiyou	Horse Creek (4112278)
<input type="checkbox"/> 4	69126	2006-12-14	2006-12-14	Presumed Extant	Specific bounded area with an 80 meter radius	Siskiyou	Horse Creek (4112278)
<input type="checkbox"/> 5	69127	2015-06-25	2015-06-25	Presumed Extant	Specific bounded area	Siskiyou	Horse Creek (4112278)
<input type="checkbox"/> 6	69146	2006-04-03	2006-04-03	Presumed Extant	Specific bounded area	Siskiyou	Horse Creek (4112278)
<input type="checkbox"/> 8	69205	2006-12-31	2006-12-31	Presumed Extant	Specific bounded area	Siskiyou	Horse Creek (4112278)

Export Selected Records From RareFind to BIOS

The previous demonstration showed how to pass selected CNDDDB occurrences in the BIOS 5 viewer to RareFind 5 (RareFind has more reporting and tabular export functions, as well as more data fields available). Conversely, a selection can be made in RareFind 5 and exported to BIOS 5 for better map and spatial data viewing. Furthermore, BIOS 5 contains a printing function that creates a PDF map of the data and view displayed in BIOS 5, which could be saved for printing, emailing, or adding to documents.

Once a query is made in RareFind 5, simply click the BIOS tab in RareFind [44]. Unlike other tabs, clicking on the BIOS tab will not take you to another screen. Instead, it will open a small window with up to five options. The BIOS tab is best used while viewing the Results tab; what you have selected in the “Elements” [45] and “Occurrences by Selected Elements” [46] tables will affect the options you may choose from.

The screenshot shows the RareFind interface with the BIOS tab selected. A dropdown menu is open, showing four options for map viewing. Below this, the 'Elements' table is visible, with the first row highlighted. The 'Occurrences by Selected Element' table is also visible, with the first row highlighted. Annotations with orange boxes and arrows point to the BIOS tab, the current element in the Elements table, and a selected occurrence in the Occurrences table.

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE RareFind																																											
Query	Results	Occurrence Details	Reports	BIOS	Export/Import	Help																																					
<div style="border: 1px solid black; padding: 5px;"> 44: BIOS tab <ul style="list-style-type: none"> Show map with no selection Show map with all returned occurrences (144) Show map with only current element's occurrences (79) Show map with only current element's selected occurrences (1) </div>																																											
<div style="border: 1px solid black; padding: 5px;"> 45: Current element <table border="1"> <thead> <tr> <th>Image Search</th> <th>Scientific Name ↑</th> <th>Common Name</th> <th>Group</th> <th>Code</th> <th>Count</th> </tr> </thead> <tbody> <tr> <td>g± / Ca</td> <td>Monotropa uniflora</td> <td>ghost-pipe</td> <td>Dicots</td> <td>PDMON03030</td> <td>100</td> </tr> <tr> <td>g± / Ca</td> <td>Rana aurora</td> <td>Common red-legged frog</td> <td>Amphibians</td> <td>AAABH01021</td> <td>292</td> </tr> </tbody> </table> </div>							Image Search	Scientific Name ↑	Common Name	Group	Code	Count	g± / Ca	Monotropa uniflora	ghost-pipe	Dicots	PDMON03030	100	g± / Ca	Rana aurora	Common red-legged frog	Amphibians	AAABH01021	292																			
Image Search	Scientific Name ↑	Common Name	Group	Code	Count																																						
g± / Ca	Monotropa uniflora	ghost-pipe	Dicots	PDMON03030	100																																						
g± / Ca	Rana aurora	Common red-legged frog	Amphibians	AAABH01021	292																																						
<div style="border: 1px solid black; padding: 5px;"> 46: Selected occurrence <table border="1"> <thead> <tr> <th colspan="7">79 occurrences returned from a total of 100 occurrences for MONOTROPA UNIFLORA ?</th> </tr> <tr> <th>Occ Number ↑</th> <th>EONdx</th> <th>Date Element Last Seen</th> <th>Date Site Last Seen</th> <th>Presence</th> <th>Accuracy</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> 2</td> <td>32432</td> <td>2018-08-18</td> <td>2018-08-18</td> <td>Presumed Extant</td> <td>Specific bounded area</td> </tr> <tr> <td><input type="checkbox"/> 3</td> <td>32433</td> <td>2018-08-18</td> <td>2018-08-18</td> <td>Presumed Extant</td> <td>Specific bounded area</td> </tr> <tr> <td><input checked="" type="checkbox"/> 4</td> <td>32433</td> <td>1958-06-18</td> <td>1958-06-18</td> <td>Presumed Extant</td> <td>Non-specific bounded area</td> </tr> <tr> <td><input type="checkbox"/> 5</td> <td>32434</td> <td>2018-08-13</td> <td>2018-08-13</td> <td>Presumed Extant</td> <td>Specific bounded area</td> </tr> </tbody> </table> </div>							79 occurrences returned from a total of 100 occurrences for MONOTROPA UNIFLORA ?							Occ Number ↑	EONdx	Date Element Last Seen	Date Site Last Seen	Presence	Accuracy	<input type="checkbox"/> 2	32432	2018-08-18	2018-08-18	Presumed Extant	Specific bounded area	<input type="checkbox"/> 3	32433	2018-08-18	2018-08-18	Presumed Extant	Specific bounded area	<input checked="" type="checkbox"/> 4	32433	1958-06-18	1958-06-18	Presumed Extant	Non-specific bounded area	<input type="checkbox"/> 5	32434	2018-08-13	2018-08-13	Presumed Extant	Specific bounded area
79 occurrences returned from a total of 100 occurrences for MONOTROPA UNIFLORA ?																																											
Occ Number ↑	EONdx	Date Element Last Seen	Date Site Last Seen	Presence	Accuracy																																						
<input type="checkbox"/> 2	32432	2018-08-18	2018-08-18	Presumed Extant	Specific bounded area																																						
<input type="checkbox"/> 3	32433	2018-08-18	2018-08-18	Presumed Extant	Specific bounded area																																						
<input checked="" type="checkbox"/> 4	32433	1958-06-18	1958-06-18	Presumed Extant	Non-specific bounded area																																						
<input type="checkbox"/> 5	32434	2018-08-13	2018-08-13	Presumed Extant	Specific bounded area																																						

- **Show map with no selection:** This option will open the BIOS 5 map viewer in a new window (if it is not open already) and then load and display the CNDDDB layer.
- **Show map with ALL returned occurrences (#):** Opens BIOS 5, loads the CNDDDB layer, and then zooms to a layer created from all the occurrences your RareFind 5 query. The number of occurrences selected is shown in the parentheses.
- **Show map with current element’s occurrences (#):** Opens BIOS 5, loads the CNDDDB layer, and then zooms to a layer created from the occurrences for the current element [45] highlighted in the RareFind Results tab (all occurrences displayed in the

Occurrences table at the bottom of the Results tab). The number of occurrences selected is shown in the parentheses.

- **Show map with current element’s selected occurrences (#):** Opens BIOS 5, loads the CNDDDB layer, and then zooms to a layer created from the selected occurrences [46] of the currently selected element (occurrences checked in the Occurrences table). The number of occurrences selected is shown in parentheses.
- **Show map with currently displayed occurrence (#):** This option is only seen when clicking on the BIOS tab while on the Occurrence Details Screen [47]. This option opens the BIOS 5 data viewer, loads the CNDDDB layer, and then zooms to a layer created from the occurrence that is currently displayed on the occurrence details screen.

The screenshot shows the BIOS browser interface with the 'Occurrence Details' tab selected. A dropdown menu is open, listing five map options:

- Show map with no selection
- Show map with all returned occurrences (144)
- Show map with only current element's occurrences (65)
- Show map with only current element's selected occurrences (0)
- Show map with currently displayed occurrence (1)

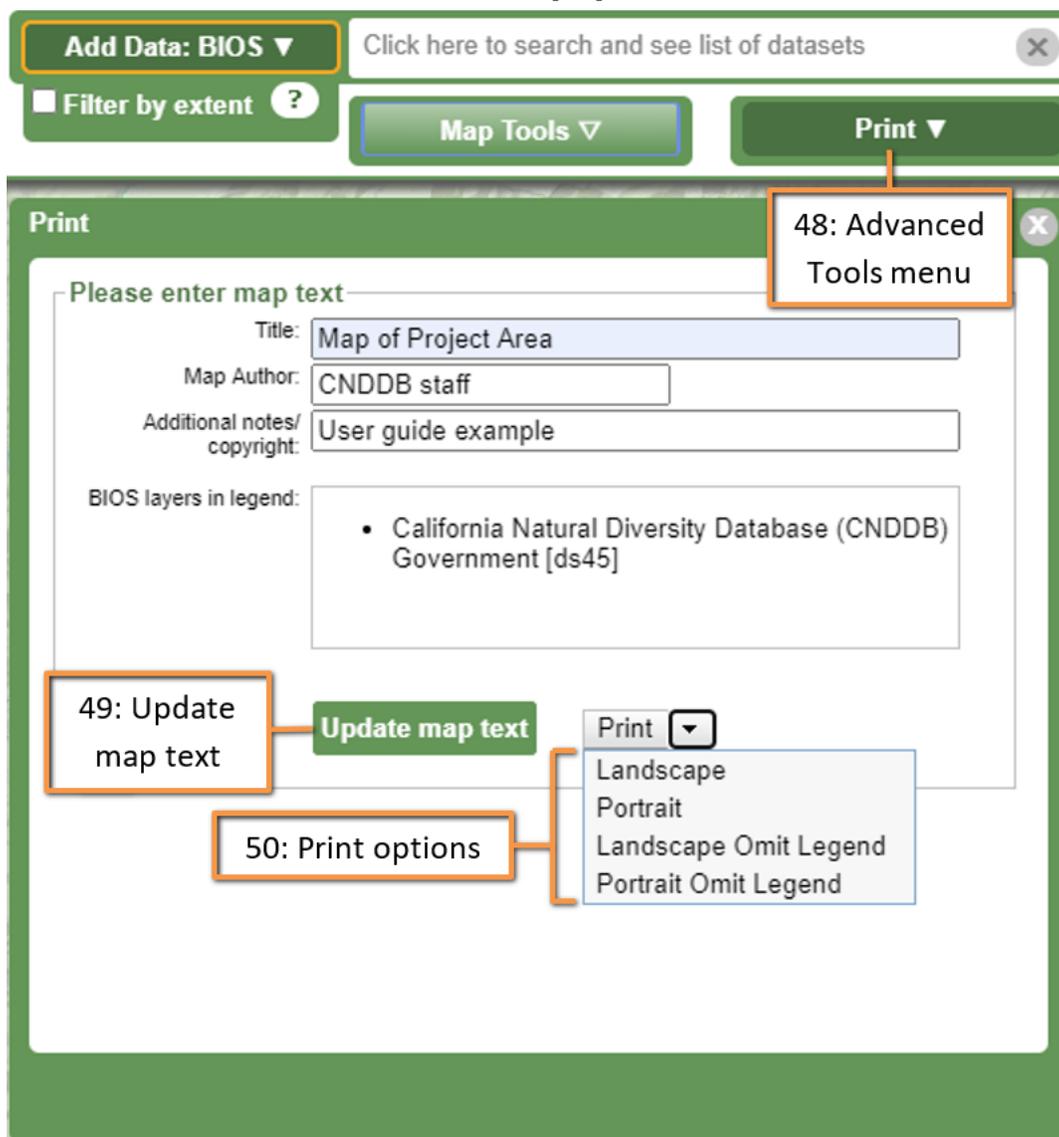
A callout box highlights the fifth option: "47: Fifth option available while on Occurrence Details tab". Below the menu, a table shows occurrence details for record 4 of 65:

Occurrence Number	EOn dx	Mapn dx	Occurrence Rank	Date Element Last Seen	Date Site Last Seen	Presence	Trend	
44	75223	74235	U-Unknown	1991-10-07	1991-10-07	Presumed Extant	Unknown	Natural

Please allow pop-ups for the BIOS browser window to open. For more information on how to work with the CNDDDB data in RareFind 5, refer to our [Rarefind 5 User Guide](#).

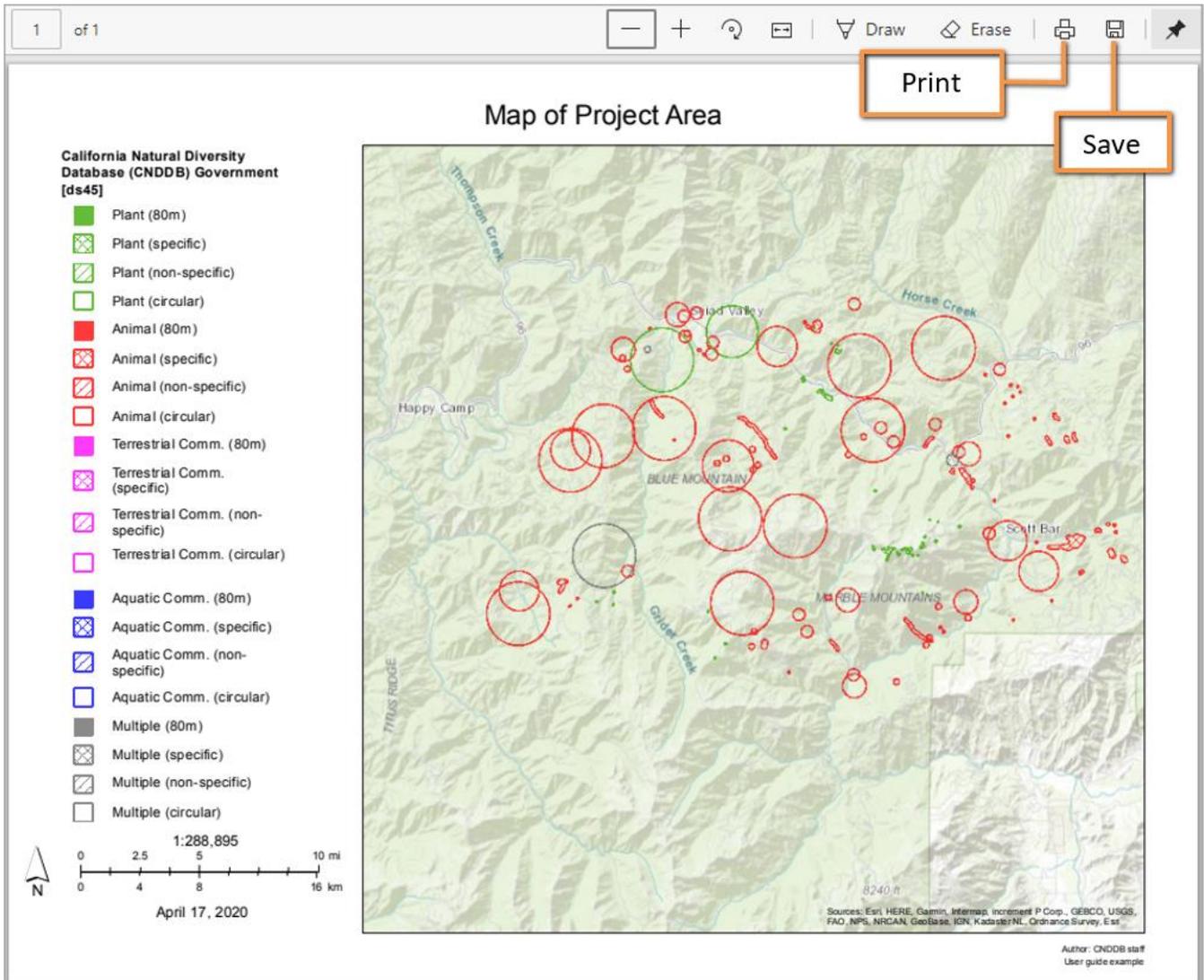
Create PDF of Map & Data

The Print tool in BIOS 5 allows you to print your current map view into a PDF. First, navigate to your area of interest, select an appropriate basemap, have the layers turned on that you are interested in showing on your map, and add any labels to your map (Add Label is an option in the Map Tools menu; see the BIOS 5 User Guide located under the Help button at the top right corner of the BIOS 5 map viewer). Once you have the view and layers set up the way you like, go to the Advanced Tools menu and select Print [48].



The Print/PDF window will pop-up where you can enter the map title, author, and any additional notes in a comment box. Once you have these fields filled-out to your liking, click "Update map text" [49]. If this button is not pressed, the default text settings would be used. The Print button next to it has a triangle drop down menu. Here, you can choose the map orientation and whether to include a legend with your map [50]. After selecting your print option, the Print button will change to "Printing" while it processes and then "Printout" when it completes. If you click on the word "Printout," a new browser window will open (please

allow pop-ups), and you will see your created map. This map can then be saved and emailed, printed, or added to a document.



Appendix 1: Operator Descriptions for Query Builder & Layer Filter

<i>Operator</i>	<i>Description</i>	<i>Example Query</i>
=	Equals	Name = 'mount whitney'
<>	Not equal to	Name <> 'mount whitney'
>	Greater than	Elevation > 14000
>=	Greater than or equal to	Elevation >= 14000
<	Less than	Elevation < 400
<=	Less than or equal to	Elevation <= 400
%	Wildcard. Allows for any character(s) at this point in a string of text	Name Like '%whit%'
AND	Joins expressions. Returns records where both are true.	Elevation > 14000 and Name = 'mount whitney'
OR	Joins expressions. Returns records where either is true.	Elevation < 100 or Name = 'mount whitney'
LIKE	Used to find a portion of text, with a wildcard '%'	Name like '%whit%'
NOT	Used to find records without a portion of text	Name not like 'whit%'
IsNull	Returns records with a null (blank) value	Name IsNull
IsNotNull	Returns all records except those with a null (blank) value	Name IsNotNull
IN	Returns records that match a specified list of values in the specified field.	Name IN ('mount whitney', 'mount tam', 'mount shasta')