DoW and the AKN:
Who, What, Where, When, Why, and How

DoW AKN Training
9 & 11 June 2026
Army Virtual

Course Packet

Packet Contents

In-class Exercises

Extra Credit Exercises

Helpful links:

Workshop Agenda: https://pointblue.github.io/dod_workshop/index.html

DoW AKN Portal: https://www.dodakn.org/

Biologist: https://data.pointblue.org/science/biologists/

Project Leader: https://data.pointblue.org/apps/projectleaders/

Bulk Uploader: https://data.pointblue.org/science/projectmanager/bulk_uploader

Analyst: https://data.pointblue.org/apps/analysts/

Protocol Search: https://data.pointblue.org/science/projectmanager/protocol_search

Data Catalog (coming soon): https://data.pointblue.org/apps/data_catalog/

RAIL: https://data.pointblue.org/apps/rail/

Observations Map: https://avianknowledge.net/index.php/observations-map/

Questions?

DoDAKN@erdc.dren.mil

Point Blue Conservation Science

ERDC ENGINEER RESEARCH & DEVELOPMENT CENTER

Klamath Bird Observatory

Exercise 1:

Create Sampling Units

Notes

Exercise 1: Create Sampling Units

Purpose: The purpose of this exercise is to learn how to create a sampling unit hierarchy for a point count survey within your AKN Project. The AKN Project you'll use for this exercise will be DOD_DEMO. All sampling units in the AKN, including Point Count Transects, are nested within Study Areas. We have already created Study Areas within DOD_DEMO based on each service branch or organization. **In this exercise, you will 1) create a Point Count Transect within your service branch or organization Study Area and then 2) create a point on your Point Count Transect**.

Key Terms and Definitions:

Project – The fundamental unit of organization within the AKN. Projects contain information about how (Protocols), who (Researchers and Users), where (Sampling Units), when (Sampling Events), and what (Sampling Event Observations) data are collected.

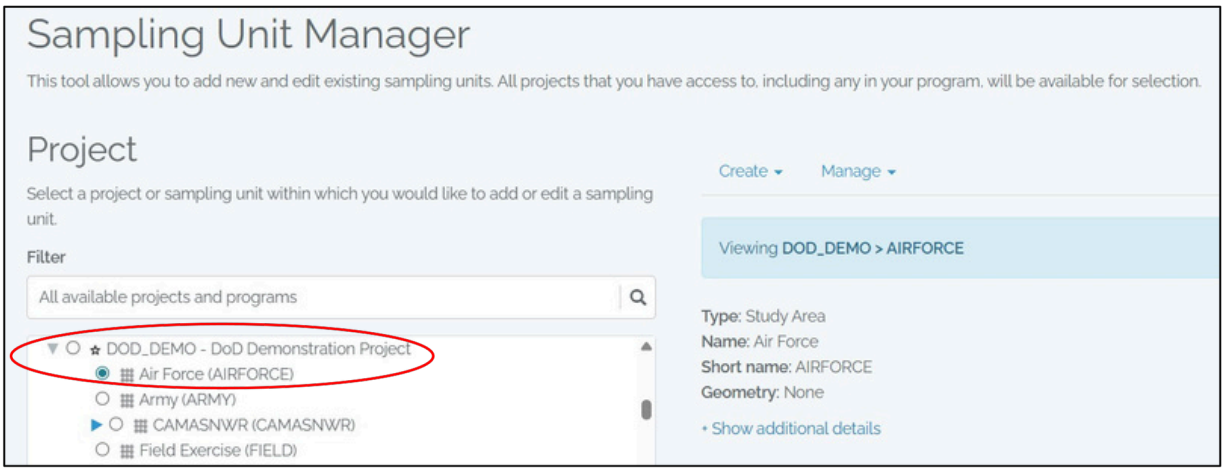
Sampling Unit – Field location where research or a survey is conducted, and samples (observations) are collected. Sampling units are arranged hierarchically within AKN Projects (e.g., Point Count Points nested within a transect). All Sampling Units are defined by a "name" and a "short name" that together must represent a unique set of characters within a Project. Sampling Units contain a location name and geometry that describes where it sits on the earth. All point, polygon, and other geographic data are described in WGS-84 Latitude-Longitude (EPSG:4326) geographical coordinate system.

Some types of Sampling Units:

> **Study Area** – Study Areas are the highest organizational level in the sampling unit hierarchy and are often used to help organize your data for analysis or management. Some AKN Projects simply create a single Study Area, while others use them to categorize different survey types, monitoring programs, or geographically distinct areas. There must be at least one Study Area in every AKN Project.
>
> **Point Count Transect** – Transects are collections of points that get analyzed as statistical replicates. All Point Count Points in the AKN must be nested underneath Point Count Transects, even if there is only one point per transect.
>
> **Point Count Point** – Points are the unique location with coordinates where your sampling takes place.

STEP 1: Locate your Study Area within the DOD_DEMO project.
In order to enter Point Count data, you must create a Point Count Transect under a Study Area, with one or more Point Count Points underneath the transect.

1. Navigate to the **Project Leader Application** on the DoW AKN Portal (https://dodakn.org) under the "Manage Data" tab and log in if needed.
2. Under "Sampling Units" Click on **Create and Manage.**
3. Locate the **DOD_DEMO** project in the white box on the left and **select the blue arrow** next to the project name to expand the sampling unit hierarchy within this project.
4. You will see a list of service branches or organizations. Click **the branch or organization most applicable to you** to select it. This is the Study Area you will nest your new transect under.



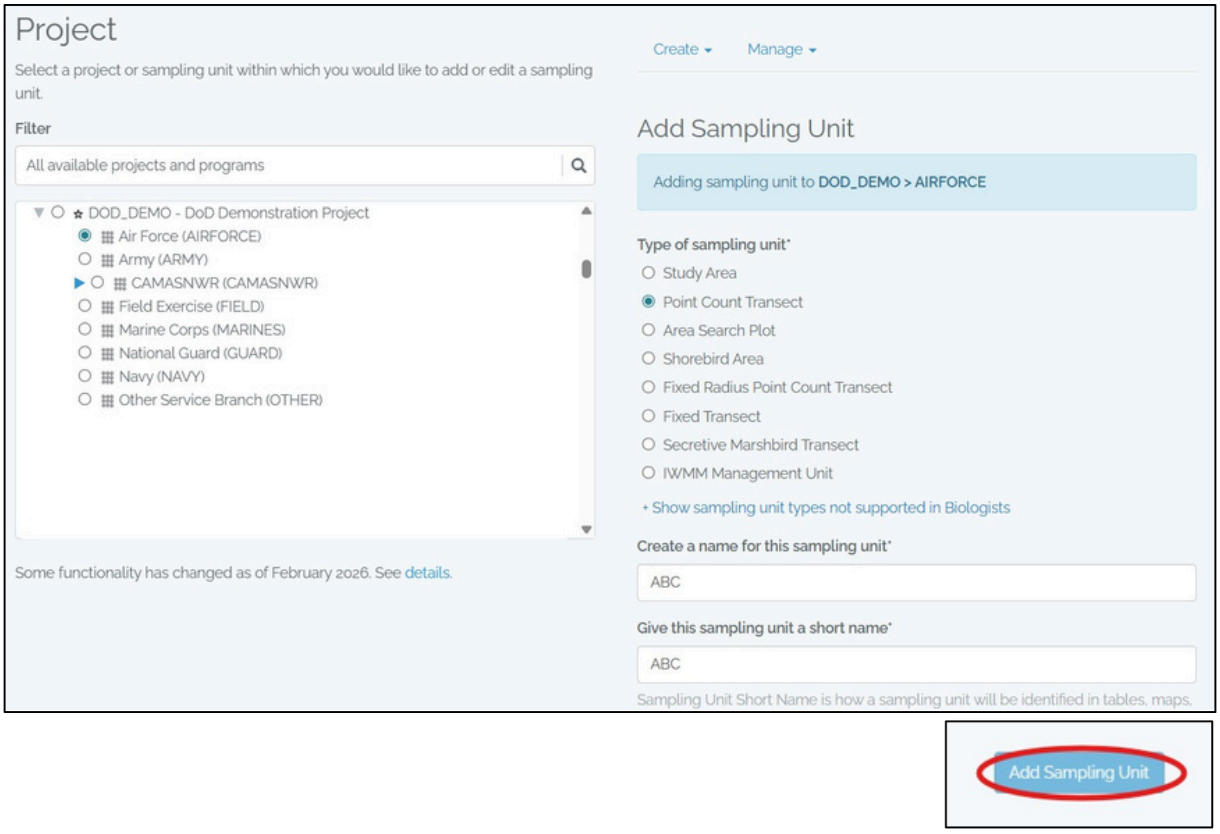
STEP 2: Create a Point Count Transect.

1. Once your service branch or organization is selected, click on "**Create**" on the right side of the page and then click "**Online form**".
2. For **Type of sampling units**, select **Point Count Transect**.
3. Fill in the information about your Transect.
   a. *"Create a name for this sampling unit"*: Come up with a **Point Count Transect Name**. This is usually 3-5 letters or numbers. For this example, you can use your initials (e.g., ABC), or a location name at your installation.
      - Remember, the combination of the short and long name must be unique within DOD_DEMO--the AKN Project– so avoid generic names such as "Transect 1".

b. *"Give this sampling unit a short name"*: Enter the **Point Count Transect Name** again. In this case, we are using the same name for both fields, as long as your transect name is 12 characters or less. If the name is too long, create an abbreviated name.

   - The long and short name are not required to match, but it is often simplest to keep them the same when possible. The short name is limited to 12 characters, so the long name can be used to provide more description when needed.

c. Skip the other fields for now, and click the blue **Add Sampling Unit** button at the bottom right of the screen.



STEP 3: Create a Point Count Point under your new Point Count Transect.
You should see your new Point Count Transect in the tree view on the left. We will now follow the same steps to add a point nested underneath the transect you just created.

1. Click on the transect name (that you just created) in the sampling unit hierarchy (white box on the left) to select it.

2. Select "**Create**" and "**Online form**" on the right side.
3. Select **Point Count Point** as the sampling unit type (the only option).
4. Fill in the information about your Point:

   a. "*Create a name for this sampling unit*": Come up with a **Point Count Point name** for the first point that will be nested under your transect.

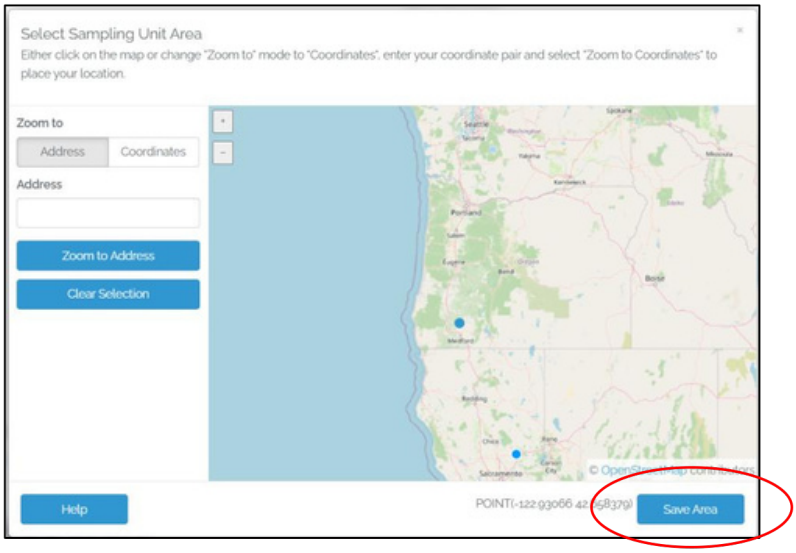
   - You might typically name your points with numbers (1,2,3, etc.), but because they have to be uniquely named, you should name your point using your transect name PLUS a number (e.g., ABC_1).
   - We will be adding more points to your transect in a later exercise, so pick a number you can easily add on to

   b. "*Give this sampling unit a short name*": use the **Point Count Point Name** again.

   c. Scroll down to "Digitize location" and click on the **Select Point** button.

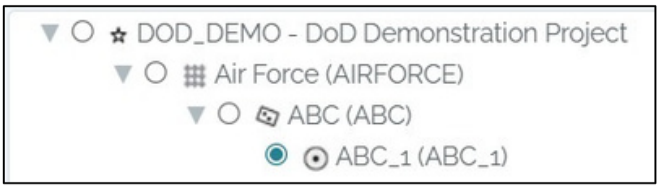
   ii. A new window will open that lets you add the location of your point. Zoom / pan to some location.

   iii. Click on the map to add a point and click the **Save Area** button. This will save a Lat/Long coordinate to the point you just created.



d. Skip the other fields for now and click **Add Sampling Unit.**

You should now see your point listed under your transect, which is under your Study Area (your service branch or organization).



Thinking Ahead: When you create sampling units for your bird surveys, they will all be in the AKN Project we create for your installation or organization. Your Study Area doesn't have to be a specific geography, in fact it can be based on your survey type (e.g., you can nest all your multi-species Point Count Transects under one Study Area, and all your Burrowing Owl surveys under a different Study Area).

Point Count Points are always nested within Point Count Transects, but you should only group points together within the same transect if they are part of the same survey (i.e., they are grouped geographically and always surveyed together on the same day).

Notes

Exercise 2:

Enter Point Count Observations

Notes

Exercise 2: Enter Point Count Observations

Purpose: The purpose of this exercise is to learn how to enter survey data, including site conditions, in the Biologists tool. Steps include creating a Sampling Event, entering observation and site condition data, and proofing the data.

Key Terms and Definitions:

Sampling Event –Represents the survey itself with a unique combination of location, date and time, person/people, and the protocol employed.

Sampling Observation – Observations made at a Sampling Event; these observations will differ depending on the specific AKN Observation Protocol being used but will contain some core fields such as species and count.

Site Condition -- Site conditions capture covariates at a Sampling Unit at a given date and time. Site condition fields apply to the entire Sampling Event, not just a single observation or record and can include fields such as weather conditions, vegetation cover, disturbance, percentage of colony surveyed, and species lists. AKN Site Condition Protocols define all of the site condition fields collected, including how they are organized in the user interface. Site conditions protocols can be applied to multiple projects if desired.

Sample Data:

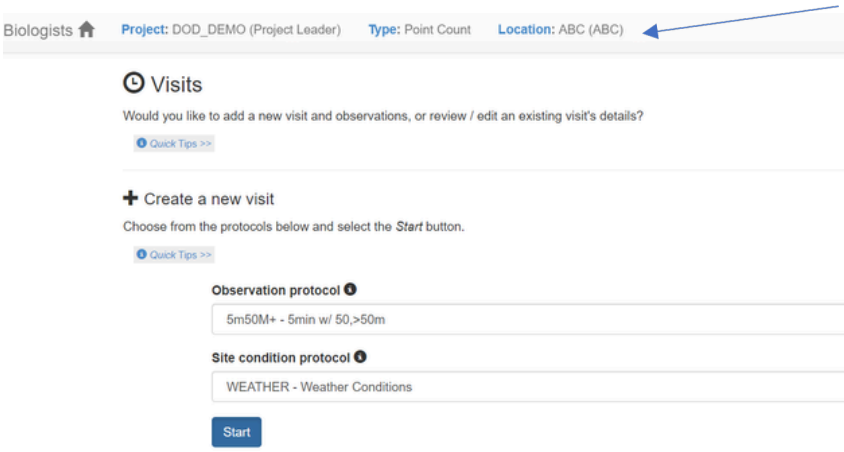
DoD Workshop 5-minute Point Count

Date (month/day/year) 03/05/2020 **Transect** _____

Temp (F) 18 **Clouds (%)** 10 **Wind (mph)** 3

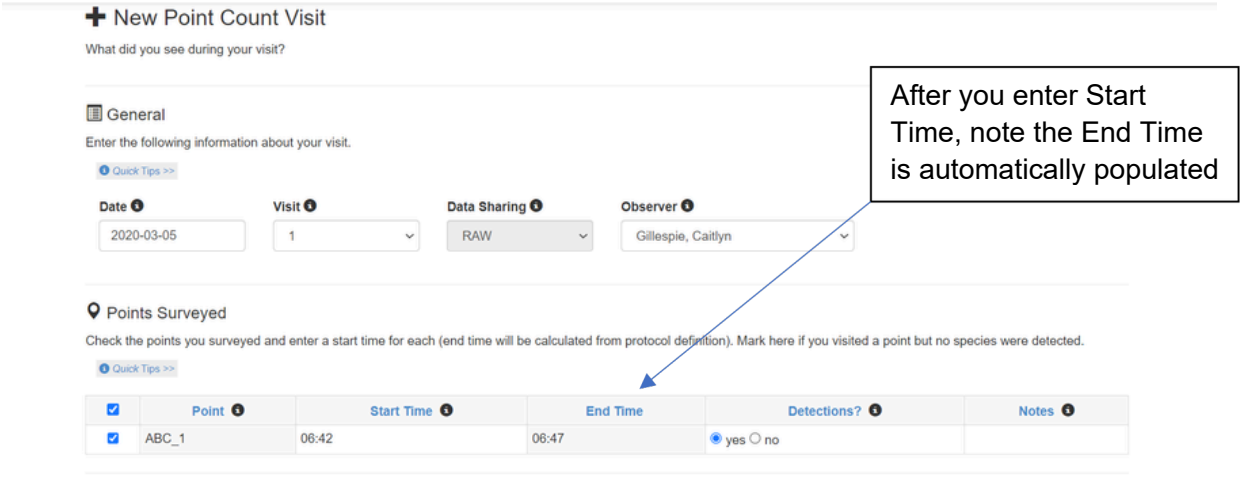
Start Time	Point #	Species				Count and Distance <50m	>50m
6:42	1	B	A	W	W	1	
6:42	1	C	O	Y	E		2

1. Navigate to the **Biologist** application and log in if needed. You can find a link to the Biologist tool under the "Manage Data" tab on the DoW AKN Portal (www.dodakn.org).
2. Select the **DOD_DEMO** project on the left.
3. Click on "**Point Count Surveys**" in the list on the right, under "Project Observation Types".
4. Find your service branch or organization and the transect you created in Exercise 1 and click on it. (Note: if there is a long list, you can search the list by using "CTRL+F" to search for and find your transect name quickly).
5. Under "Create a new visit", select the following:
   a. Observation Protocol: **5m50M+**
   b. Site condition Protocol: **WEATHER**
   c. Click the **Start** button.

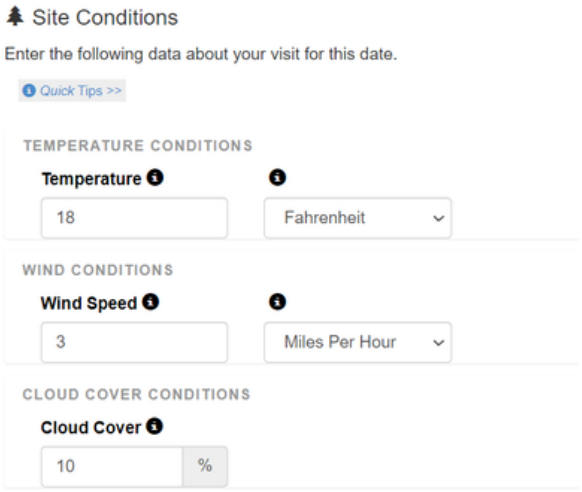


Notice that the top bar reminds you the project (DOD_DEMO), observation type (Point Count), and sampling unit (ABC) you are entering data under.

6. Under "General", fill out the information using the data sheet on the previous page:
   a. **Date** - (Use the calendar to select a date; or enter month, day, and year in any format. It will automatically be converted to yyyy-mm-dd).
   b. **Visit** - 1
   c. **Data sharing level** - set to RAW and cannot be changed.
   d. **Observer** - you will see everyone in the project can be selected. For this exercise, select yourself.
7. Under "Points Surveyed", check the box next to your point (this should be the only point listed), and fill out the **Start Time**.

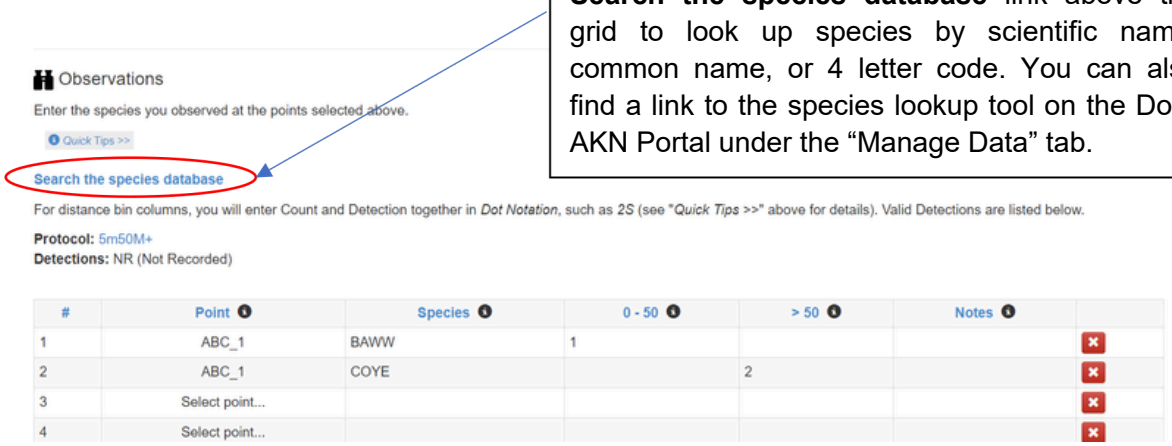


8. Under “Site Conditions”, enter the values from the top of the data sheet.



Notice how the drop-down menus for this site condition protocol make it flexible for different data collection methods. For example, temperature can be Fahrenheit or Celsius, and wind can be measured in mph, kph, Beaufort scale, etc.

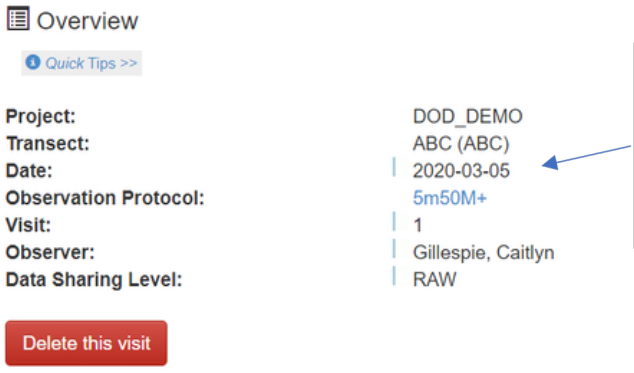
9. Under “Observations”, enter the observation data. (Tip: Use your “Tab” key to quickly move between columns and down to the next row).
    a. **Point** – use the dropdown box to select the point you created.
    b. **Species** - enter using 4 letter codes (IBP/AOU list + common uncertain ids.)
    c. **Distance bins** - enter Count as collected on data sheet.



If you do not know the species code, click the **Search the species database** link above the grid to look up species by scientific name, common name, or 4 letter code. You can also find a link to the species lookup tool on the DoW AKN Portal under the "Manage Data" tab.

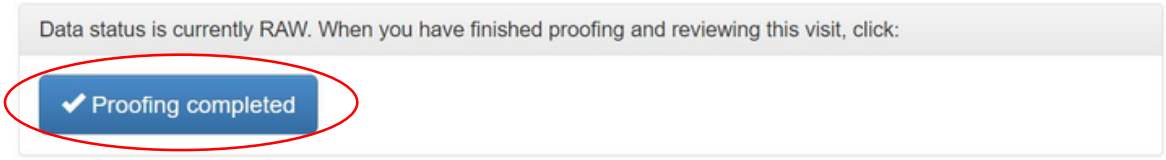
d. Click **Save to Database** when finished.
   i. If you made any errors or forgot to fill in a required field, you will get a red message at the top of the screen. Go correct the error and click the "Save to Database" button again.
   ii. If you are successful you should see a green message at the top of the screen.

e. After saving to the database, you will be taken to the proofing page. Review what you entered to locate any mistakes.
   i. If you find a mistake, you can double click on the field and edit the field to correct.
   ii. Click the **Add more** button if you forgot a line, such as an entire species, for the event.



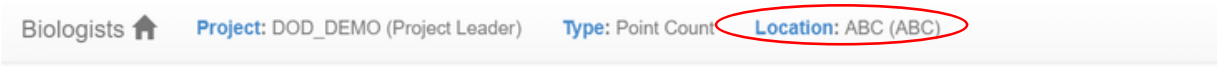
Any field next to a blue vertical line can be edited on the proofing page—simply double click on it to edit. For example, if the date was entered wrong, it could be changed here.

f. When you are satisfied, click the blue **Proofing Completed** button near the top of the page.



Your data entry for this survey is now complete. You will see your survey in the list of Visits, and you should see that the Data Sharing Level is set to CLEAN.

Note: If you want to enter data at a new transect within the same project, click on the "Location" link at the top of the page. This will take you back to the screen to select a new transect.



Thinking Ahead: Once the data is entered in Biologists and the proofing step has been completed, the data will be marked CLEAN. Data that is marked CLEAN will load into the data warehouse overnight, making it available in analysis tools such as Analyst and Data Downloader. AKN users who collect data, but aren't project leaders, can be granted access to the Biologists application to enter and proof their own data at the conclusion of each survey. Project Leaders are responsible for granting access to the project, adding the correct observation and site condition protocols to the project, and setting up Sampling Units.

Notes

Exercise 3:

Bulk Load Sampling Units

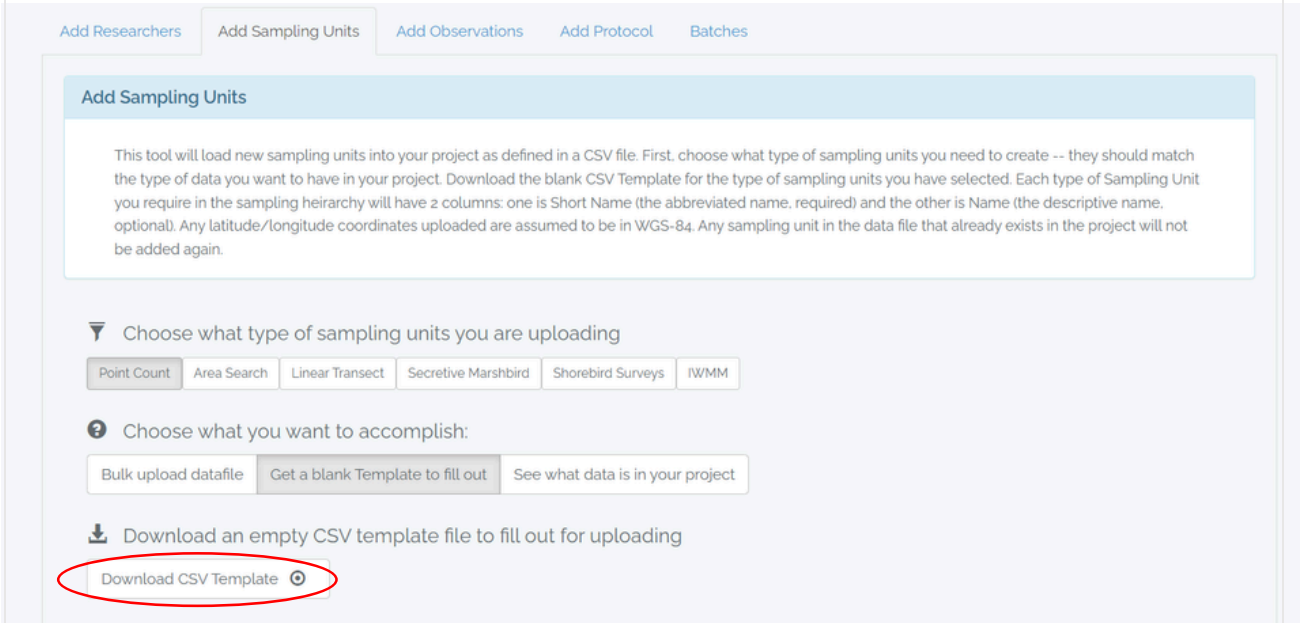
Notes

Exercise 3: Bulk Load Sampling Units

Purpose: This exercise gives you an introduction to the Bulk Uploader tool. In Exercise 1, you used the Sampling Unit Manager tool to create Sampling Units (a transect with one associated point). In this exercise, we will demonstrate how to create multiple sampling units at once for a given survey type (Point Count, Area Search, etc) in a spreadsheet and use the Bulk Uploader tool to upload them to the AKN. In this exercise, we are going to **1) bulk load a new point onto your existing transect,** and **2) add a new transect with three new points**.

Steps:

1. Navigate to the **Bulk Uploader** application and log in if needed. (You can find a link to the Bulk Uploader application under "Manage Data" tab on the DoW AKN Portal at www.dodakn.org).
2. In the dropdown box, select the project: **DOD_DEMO**
3. Click on "**Add Sampling Units**" in the tabs below the project.
4. Click on "**Point Count"** in the choice of sampling unit types.
5. Click on "**Get a blank template to fill out"** under *Choose what you want to accomplish*.
6. Click on the "**Download CSV Template**" button and you will get a CSV file downloaded to your computer. If you are unable to download the file due to your computer settings, reach out to an instructor who can help you manually create a template.



7. Using **Excel** or other spreadsheet program of your choice, open the CSV template file to define our new Sampling Units.
    a. First, enter the Study Area under which you are creating new Point Count Transects.
        i. In the first 2 columns **(Study Area Short Name** and **Study Area Name),** put the Short Name and the Name of the Study Area you've been working in (this is your service branch or organization- you can see the short and full names for your Study Area in Project Leader by expanding the tree view on the left side of the page. The short name is in parentheses after the full name).
        ii. Copy these 2 cells down in the next 3 rows so you have a total of 4 rows with your Study Area names (your service branch – Air Force shown for an example).

Study Area Short Name	Study Area Name
AIRFORCE	Air Force
AIRFORCE	Air Force
AIRFORCE	Air Force
AIRFORCE	Air Force

    b. Next, define the existing and new Point Count Transects you want to create points under.
        i. In row 2, for the **Point Count Transect Short Name** and **Point Count Transect Name** (Column C and D), enter the name of the transect you created in Exercise 1. This transect already exists, we are just adding a new point to it. (*Tip: use the following table for reference*).
        ii. In row 3, Columns C and D, add a new Point Count Transect Short Name and Point Count Transect Name. The Name and Short Name can be the same as each other, but they have to be different from all others in the project.
        iii. In row 4 and 5, copy the information from row 3 into Columns C and D. This will create three rows for this transect and leaves space to add three points. Your spreadsheet should now look something like this:

	A	*B*	*C*	*D*
1	Study Area Short Name	Study Area Name	Point Count Transect Short Name	Point Count Transect Name
2	AIRFORCE	Air Force	ABC	ABC
3	AIRFORCE	Air Force	DEF	DEF
4	AIRFORCE	Air Force	DEF	DEF
5	AIRFORCE	Air Force	DEF	DEF

c. Next, add points to the transects.

i. In row 2, for the **Point Count Point Short Name** and **Point Count Point Name**, enter a ***new*** point name. (If you follow the naming scheme from Exercise 1 and named your first point "1", you should name this point "2".)

ii. In rows 3, 4, and 5 for Columns E and F (Point Count Point), add 3 more new point names. You should now have four unique point names in columns E and F, and your Spreadsheet should look similar to this:

Study Area Short Name	Study Area Name	Point Count Transect Short Name	Point Count Transect Name	Point Count Point Short Name	Point Count Point Name
GUARD	National Guard	ABC	ABC	ABC_2	ABC_2
GUARD	National Guard	DEF	DEF	DEF_1	DEF_1
GUARD	National Guard	DEF	DEF	DEF_2	DEF_2
GUARD	National Guard	DEF	DEF	DEF_3	DEF_3

d. You can leave Latitude and Longitude blank for now.

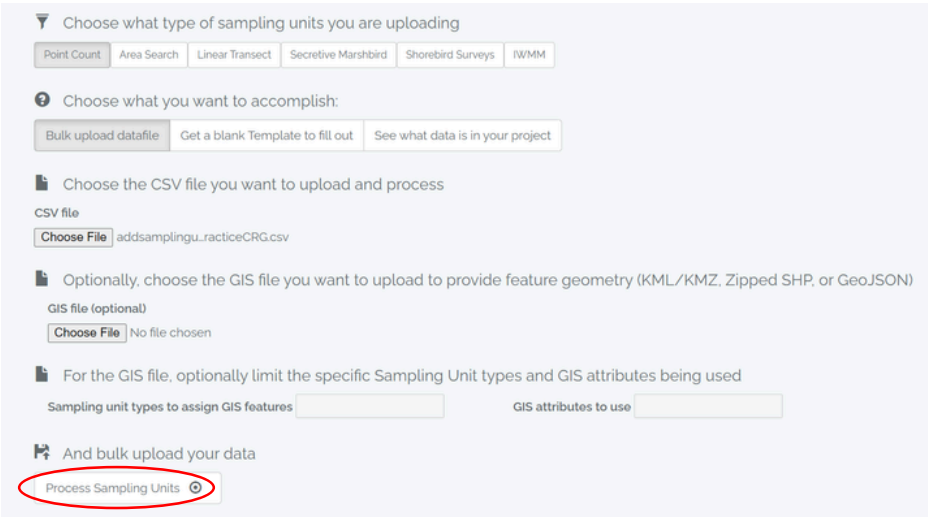
e. Save the sheet as a CSV file. **Note where you've saved it** and the name of the file.

i. NOTE: this feature is not available in the online version of Excel. Ask for help if you are unable to save your spreadsheet as a CSV file.

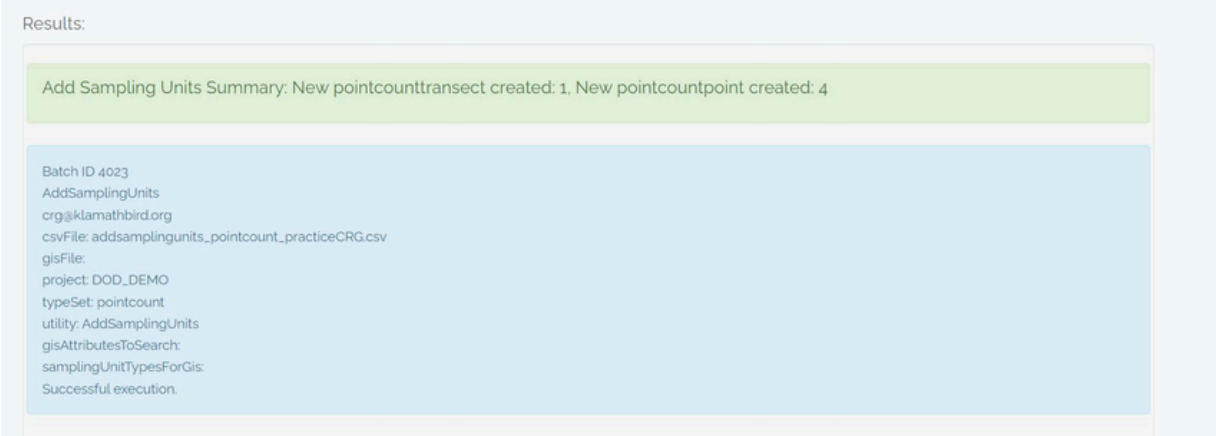
8. Return to **Bulk Uploader** (following Steps 1- 4 again if necessary). This time under "*Choose what you want to accomplish*", click the "**Bulk upload datafile"** option.

9. Under "*Choose the CSV file you want to upload and process"*, click the "**Choose File"** button and select the CSV file you just saved.

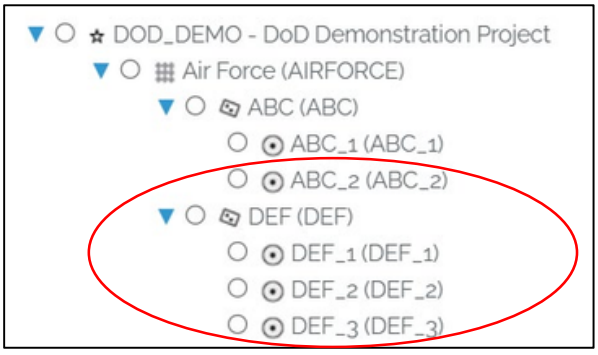
10. At the bottom of the form, click the "**Process Sampling Units"** button (skipping the optional step to upload a GIS file.)



11. The tool will submit your CSV as a “batch” for processing on the server which may take some time. If you did everything correctly, you should see a green message when it is completed with the number of new sampling units created. If you got a red message, that means the application hit a problem with your CSV file. Based on the message, reopen the CSV file, make changes, save it, and return to step 8.



12. See how your Sampling Units look in the project. Navigate back to the Sampling Unit Manager tool and expand the DOD_DEMO project. You should see the new Sampling Units you created in the sampling unit hierarchy for the project.



Thinking Ahead: The Bulk Upload tool is useful when you have many sampling units that you need to add to your project and it would be too time-consuming to add point count transects one at a time. You can use this tool to add sampling units to an existing hierarchy or create an entirely new hierarchy. The Bulk Uploader can also be used to add Researchers to your project or to upload Observation data, but we will not be covering those use cases in this exercise. Historic data is typically entered as a bulk upload.

Exercise 4:

Create a Species List with Rapid Avian Information Locator (RAIL) Tool

Notes

Exercise 4: Create a species list with Rapid Avian Information Locator (RAIL) Tool

Purpose: The purpose of this exercise is to familiarize you with the RAIL analysis tool. The RAIL tool is available without an AKN account. This is a good starting point for finding species information, including PIF population estimates, conservation status, and phenology for any location in the continental U.S. While not intended to provide final data for reports, it can help you find some general information about the species in a particular area and their conservation status.

About the Tool: The species lists you get in the tool are based on an analysis of data from the AKN at sharing level 2-5 along with other datasets, such as BBS and eBird. It is important to understand that the data presented here is modeled on a 10-km grid, so the species list won't necessarily be exactly tied to the geographic boundary you have drawn—it may include more species than you would expect, or it may exclude species you know are there because they were not abundant in the datasets used for the analysis. Also note that all subspecies are grouped at the species level in this tool.

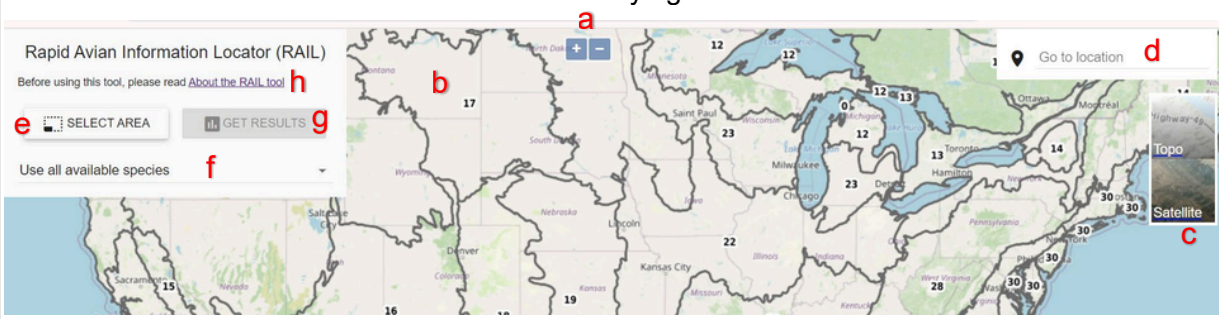
Goal: Become comfortable navigating the RAIL tool to find information about species on your installation, and understand the limitations of the tool.

Steps:

1. Navigate to the **Rapid Avian Information Locator (RAIL)** tool. (You can find a link to the RAIL tool on the DoW AKN Portal, www.dodakn.org, under the "Manage Data" tab. Scroll down to the heading "Make Decisions" and click on the RAIL tool.)
2. Let's start by getting oriented to navigating the map and selecting in the RAIL Tool.
   - **a.** To **zoom in / out**, click on the Plus/Minus icons at the top of the screen. You can also **Double click** the mouse to zoom in and **Shift-Double click** to zoom out.
   - **b.** To **pan**, click-hold the mouse and drag.
   - **c.** To change the **underlying base map**, click on either the Topo or Satellite options in the upper right corner.
   - **d. Go to location** – on the top right-hand side of the window, you can type in an address or place name, hit Enter, and the map will zoom to that location.
   - **e. Select Area** - this lets you draw a polygon on the map, ending that polygon entry by double clicking to close or by clicking again on the first point. As soon as the area is defined, the Get Results button becomes available.
   - **f. Use all available species** – this lets you select specific species to query. The default is all available species, but you can type species names or codes into this box to query for a list of specific species.

g. **Get Results** – this will load the RAIL report on species you chose found in the area you drew. Click on **FILTER RESULTS** button at the top of the report to filter species by a variety of characteristics. Click on the expand button at the right side of any row to get full description about this species, including PIF population estimates, physical characteristics, habitat, biology, conservation status, picture, distribution map, and AKN phenology graph.

h. **About the RAIL tool –** click on this link above the tool to get complete information about all of the underlying data.



3. You need to get a species list for your installation because you are doing a NEPA assessment for a project. Zoom into your location, and find out what species are found and what information the tool provides to help you in your NEPA analysis. What data can you find on DoW Mission Sensitive Species (see below)?
4. The data underlying the RAIL tool species selection is modeled to a 10-km Military Grid Reference System (MGRS) grid. Zoom out to a broader area and rerun the search for a larger area around your installation. How spatially sensitive is the model?
5. Extra credit: go to eBird Bar Chart tool (https://ebird.org/GuideMe?cmd=changeLocation) and create a similar output for your area. How similar or different are the resulting species lists between these two tools?

DoW Mission Sensitive Species list

Northern Bobwhite
Greater Sage-Grouse
Mountain Plover
Greater Prairie-Chicken
Burrowing Owl
Least Tern (Atlantic Coast Pop)
Cerulean Warbler
Golden-winged Warbler
Pinyon Jay
Southeastern American Kestrel
Henslow's Sparrow
Rusty Blackbird
Bendire's Thrasher
Tricolored Blackbird
Bachman's Sparrow

Exercise 5:

Explore Species and Trends with Observations Map and Analyst

Notes

Exercise 5: Explore species and trends with Observations Map and Analyst

Purpose: In this exercise, we will introduce you to two other data exploration and discovery tools in the AKN.

The Observations Map lets you explore survey locations and data from multiple sources (AKN, BBS, or eBird) and examine species occurrence and trends. Unlike the RAIL tool, this is not a modeled dataset, but actual observation data that has been set to Level 2 sharing and above.

The Analyst Application allows you to retrieve and analyze data in your project. This tool requires an account and is available to anyone that is a Project Leader in your project.

Goals: 1) Understand how to use the Observations Map to find survey locations from different datasets for a particular species and examine species trends. 2) Use the Analyst Application to create a species list, check effort summaries, and examine trends.

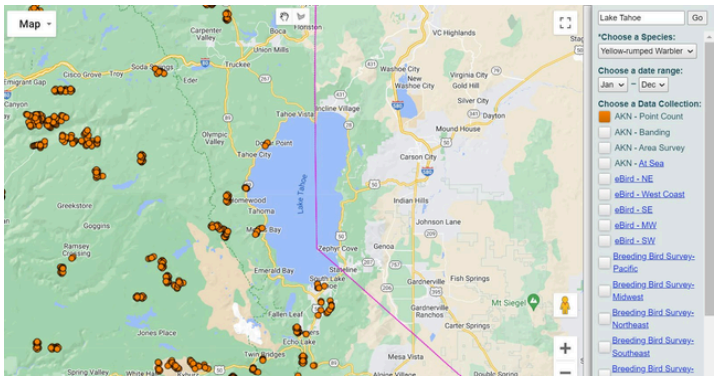
Observations Map

1. Navigate to the **Observations Map**. You can find a link on the DoW AKN Portal (www.dodakn.org) under the "Manage Data" tab. Scroll down to the heading "Explore Data" and click on the Observation Map.
2. Let's start by getting oriented to the Observations Map:
   a. To **zoom in / out**, scroll or click on the Plus/Minus icons in the menu in the lower right corner. You can also double-click the mouse to zoom.
   b. To **pan**, click-hold the mouse and drag.
   c. "**Search by address**" lets you zoom into a specific area by name. Type in a place name and click Go.

d. Once you have zoomed in on the area you want to investigate, look at the dropdown menu under **Choose a species** - the tool requires you to pick a specific species first. Pick one from the dropdown list, and you will see the Data Collections turn on.

e. **Choose a date range** - use this if you want to further filter the search to be only within a range of months (say the breeding season), or leave it as Jan - Dec.

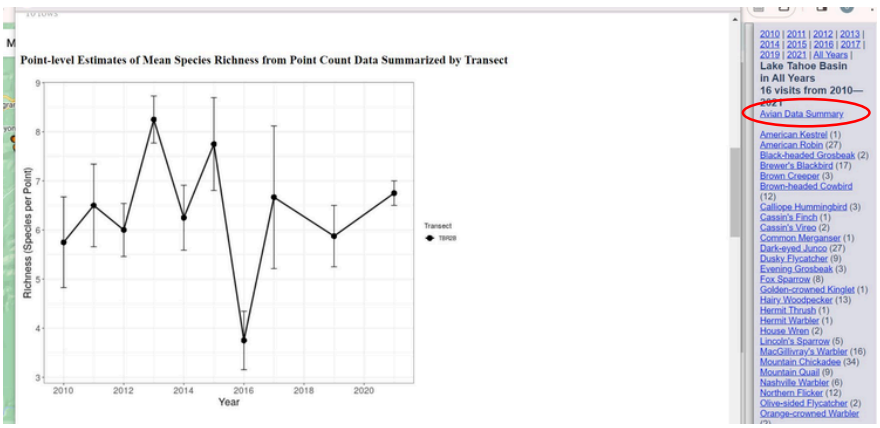
f. **Choose a data collection** - choose from the AKN (all from our data warehouses), eBird, and BBS collections. Dots will appear in colors showing where observations were made for that species in the area you're looking at. Note that some of the larger collections (e.g. eBird) are broken into regional datasets for system performance.



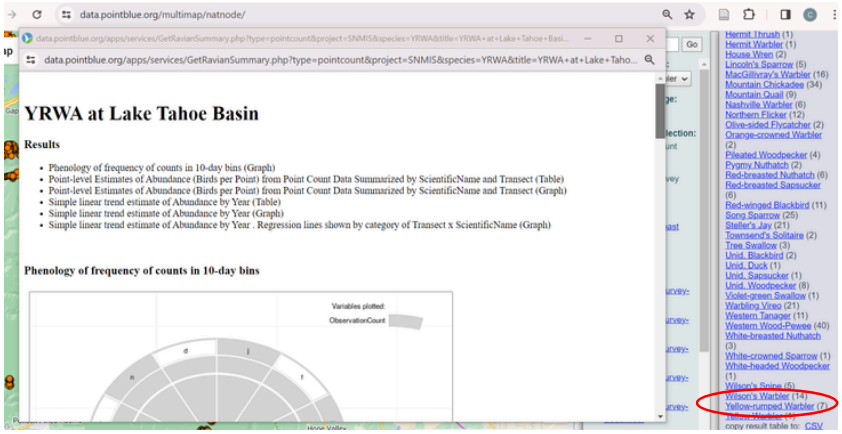
g. Click on a map dot - this will give you information about what was surveyed and observed at that location in the panel to the right.

i. If a year is listed at the top, you can click on it to see a summary of that year.

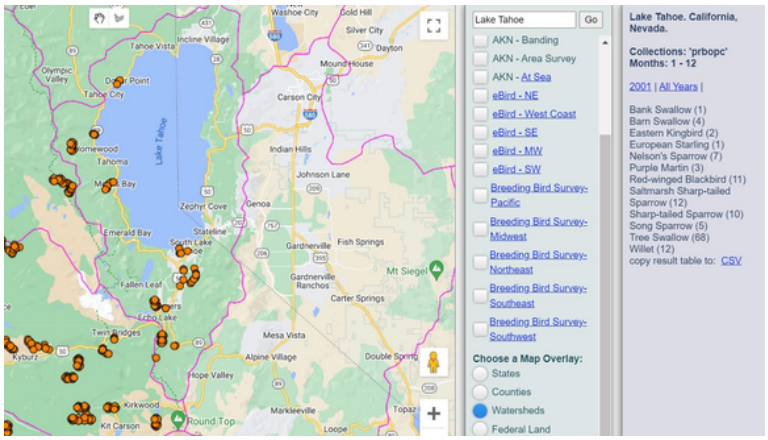
ii. **Avian Data Summary** - for AKN or BBS data only, click on this link to get an Analyst report of **species richness** for this location. (Be patient letting this live analytics report run. You'll see a twirling icon in the upper left corner while it is running.)



iii. **Species** - for AKN or BBS data only, click on a species link to get an Analyst report of **phenology** and **species abundance**. Again, be patient in letting this live analytics report run.



h. Choose a map overlay – you can visualize and summarize specific areas on the map by choosing a map overlay. Choose the type of summary you are interested in (try "Watersheds"), and **click on the map somewhere within the polygon you want to summarize**. You will get a summary of observations for that area in the right panel. Note, state summaries take several minutes to run and load.



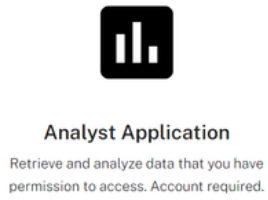
Example: Use the Observations Map to find data and trends

You are doing a quick assessment of Brewer's sparrows around Lake Havasu City and are interested in seeing what data/information is available from the AKN.

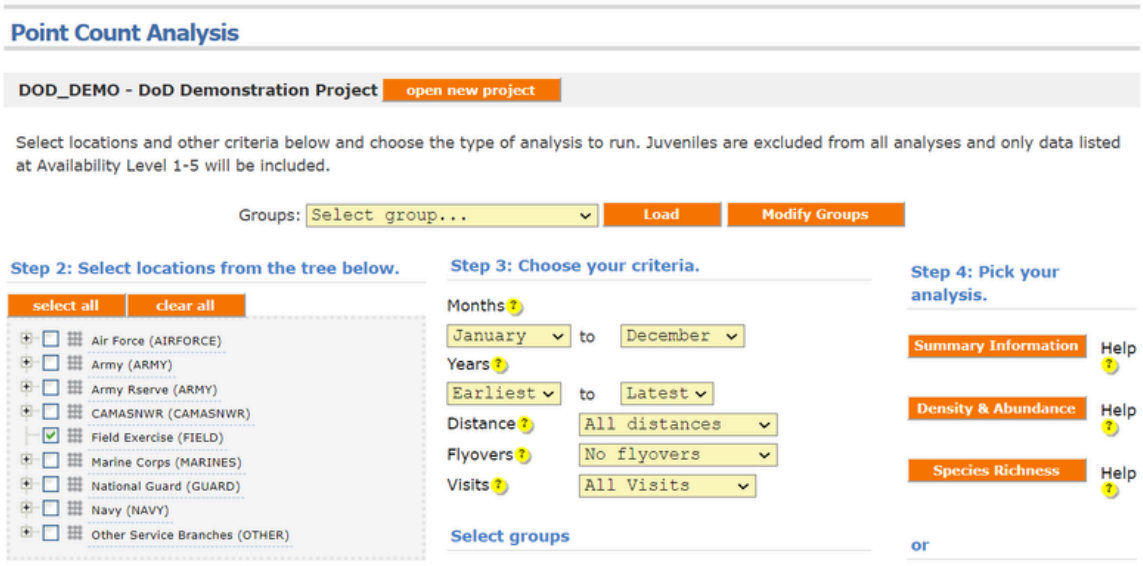
a. What do you see about where observations are?
b. What trends do you see about Brewer's sparrows?

Analyst

1. Navigate to the **Analyst** application and log in if needed. You can find a link to the Analyst application on the DoW AKN Portal (www.dodakn.org). Click on the "Manage Data" tab on the home screen. Scroll down to the heading "Explore Data" and click on the Analyst application.

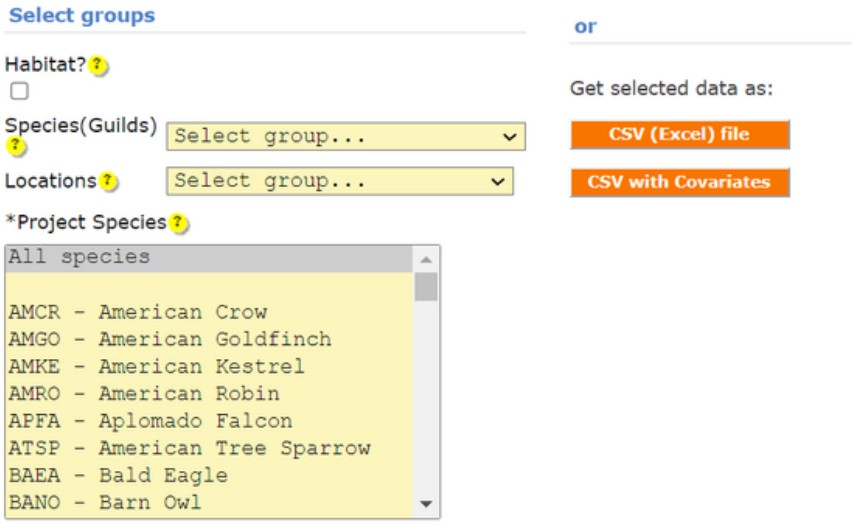


2. The next page asks you to select the type of data you will be analyzing. Click on "**Point Counts**".
3. Select the project **DOD_DEMO** and click the orange "Next" button.
    a. Note that if you have more than one project, you can analyze data for multiple projects at once. Hold down the control button to select more than one project.



4. At the top you will see "Groups", this does not apply to this project and can be left blank.
5. Under "Step 2", select the sampling units you would like to analyze.
    a. If you completed the Field Exercise during this training, find your transect name and check the box next to it. (If not, select the "CAMASNWR" sampling unit.)
    b. Click on '+' icons to expand the menu. Selecting a transect will automatically select all the points that are nested under it.
    c. If the project contains a large amount of data, not all tools will run. If this occurs, you can limit your data by selecting a lower level of sampling unit (or changing other criteria).
6. Under "Step 3", choose the criteria of the data you would like to analyze.
    a. **Months** and **Years**: Can be used to select specific months and years. In this case can be left as "Earliest" to "Latest".
    b. **Distance**: Use the dropdown box to change distance to "All Distances"
    c. **Flyovers**: The default is set to exclude flyovers, but you can choose to include flyovers if you want to.

d. **Visits**: Default is set to “All Visits”.
e. You can leave the “Species (Guilds)” and “Location” fields blank.
f. Under “**Project Species**”, select either “All species” or the species you would like to analyze, you can select more than one by holding the Shift key.



7. Under “Step 4”, select the type of Analysis you would like to run. Each of the options is discussed below.

Types of Analyses

Summary Information

This is a great way to quickly summarize data and effort. This analysis provides tables for number of visits, observations, and species by month and year. As well as provides a table of richness, diversity, dominance and evenness indices for all locations selected.

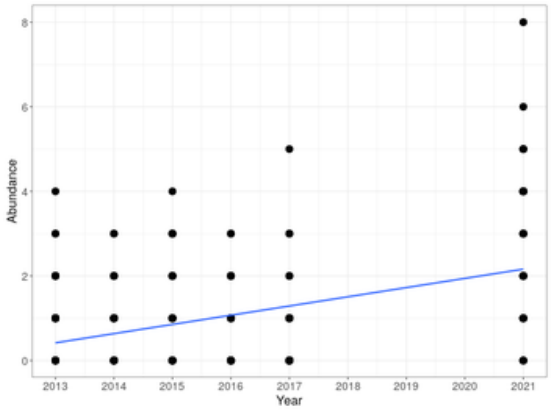
Common Name	2013	2014	2015	2016	2017	2021
Acadian Flycatcher	6	11	25	12	14	15
Alder Flycatcher	0	0	0	0	1	0
American Crow	41	28	42	29	24	113
American Goldfinch	14	1	5	6	3	16
American Redstart	0	1	0	1	1	2
American Robin	0	0	0	0	1	0
Barred Owl	0	0	0	0	0	1

Example of number of observation of species by year.

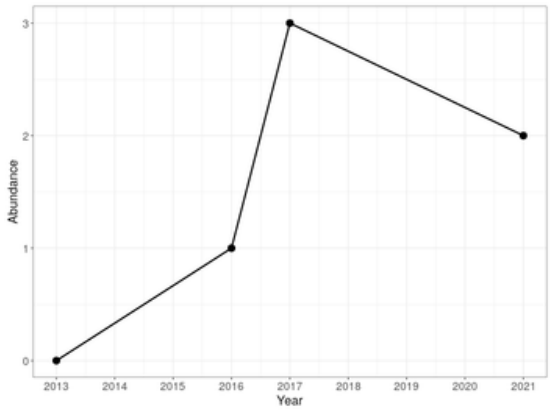
Density and Abundance

This tool summarizes density estimates by transect in a graph and table format, as well as provides a simple linear trend analysis on density and a trend analysis on abundance.

This tool works best with limited species selected; it starts to run slowly with too much data. If you receive an error message, try decreasing the number of species selected under “Project Species”.



Example of linear trends in abundance over years.



Example point level estimate of abundance for AMCR.

Species Richness

This analysis provides point-level mean species richness estimate for each transect each year in table and graph format. It also provides a linear trend analysis for this measure grouped by transect and overall.

Extra Credit: Explore Camas National Wildlife Refuge Data

In DOD_DEMO, there is an example dataset from the Camas National Wildlife Refuge. This is a real dataset from the AKN (available openly at sharing Level 5 to download in the Data Downloader tool). You can read more about this study here: https://meridian.allenpress.com/jfwm/article/12/1/27/462421/Sagebrush-Bird-Communities-Differ-with-Varying

You can use this dataset to explore examples of trends and abundance for sagebrush-associated birds.

1) In Analyst under the DOD_DEMO project, check the box next to the **CAMASNWR** study area.
2) Explore the available analyses to answer the following questions:
    a. What years are available for this data? _____
    b. How many species were observed across all years of the project? _____
    c. How many times per year were these points monitored? _____
    d. What was the most abundant species in each year? _____

    _____

    e. Examine graphs of density and abundance for Western Meadowlark, Horned Lark, Brewer's Sparrow, and Sagebrush Sparrow. What do you notice about the trends for these species? _____

    _____

    f. Notice how the three transects are separated by habitat type (MONO= Crested Wheatgrass, NON= Sagebrush with non-native understory, SAGE= Sagebrush with native understory). Does the overall abundance and trend for these species differ by transect? _____

    _____

    g. Examine the species richness graphs. How does species richness vary by habitat type? _____

    _____

Answer Key available on training website, under the "Exercises" tab.

Notes

Extra Credit

Exercise A:

Downloading Sampling Units

Notes

Exercise A: Downloading Sampling Units

Purpose: The purpose of this exercise is to learn how to download sampling units within your AKN Project to support a point count survey. The AKN Project you'll use for this exercise will be DOD_DEMO.

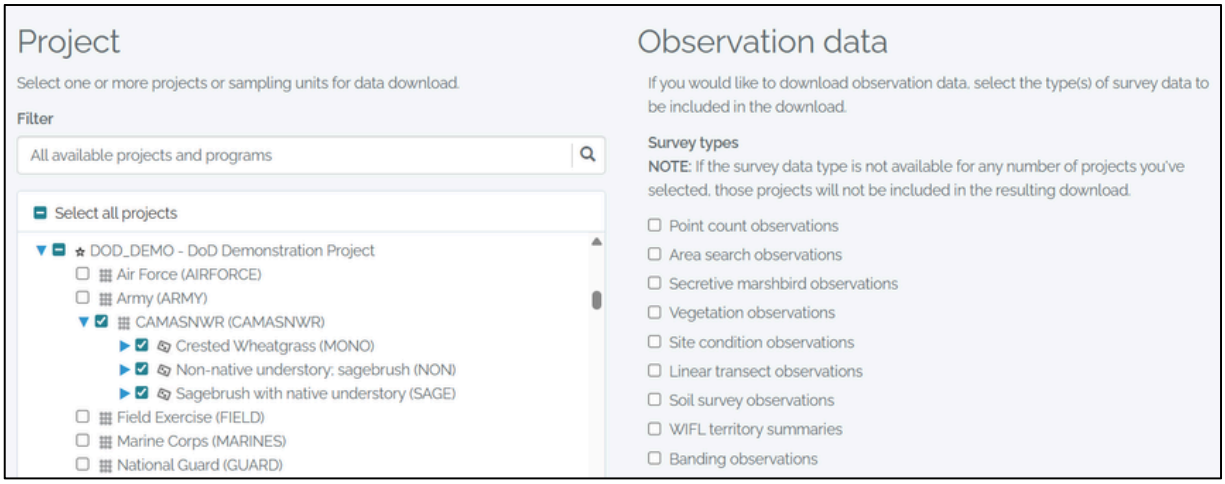
Key Terms and Definitions

Project: The fundamental unit of organization for observation data within the AKN. Projects contain information about how (Protocols), who (Researchers and Users), where (Sampling Units), when (Sampling Events), and what (Sampling Event Observations) data are collected.

Sampling Unit—Field location where research or a survey is conducted and samples (observations) are collected. Sampling Units are arranged hierarchically within AKN Projects (e.g. Point Count Points nested within a transect). Sampling Units contain a location name and geometry that describes where it sits on the earth. All point, polygon, and other geographic data are described in WGS-84 Latitude-Longitude (EPSG:4326) geographical coordinate system.

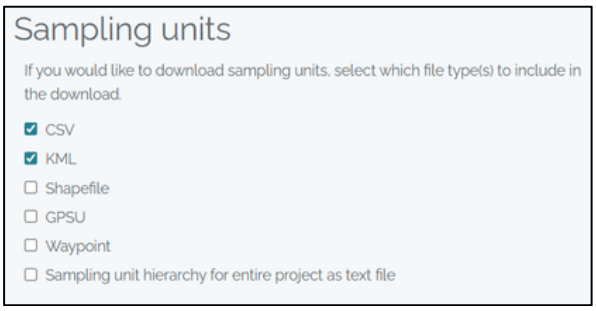
Download Sampling Units

1. Navigate to the **Project Downloader** application and log in if needed. You can find a link on the DoW AKN Portal (www.dodakn.org) under the "Manage Data" tab. Scroll down to the "Discover Data" section and click on "Raw Data Download".
2. On the left side, you'll see a list of projects. Click the blue triangle icon next to the **DOD_DEMO** project to see the list of service branch or organization study areas.
3. Select the blue triangle icon next to your branch or organization to see the list of transects nested underneath.



4. Click on the box next to the transects you wish to download. This will automatically check the boxes for all points nested under the transects you select.

5. On the right-hand side, under the “Sampling Units” header, you’ll notice several options for what type of file you wish to download your Sampling Units in. Try checking the box next to “KML” to download a .kml file. (This is a format that can be uploaded to most GPS units.) Alternatively, if you just want to see a list of your points and their coordinates, click on the box next to “CSV” to download a spreadsheet with your information. You can select multiple formats to download at once.



6. After you have made your selection(s), click the blue “Download” button. Once sampling units are downloaded, they can be used in a mapping program such as Google maps or ArcGIS, or they can be uploaded onto a GPS for use in the field. Note: Make sure to unzip the outer folder before loading zipped shapefiles into software programs.

View your Sampling Units in Google Earth (no account required)

1. On your web browser, go to https://earth.google.com/web/
2. On the left, click the button that says “New +”.
3. Select “Import KML file to map project” from the list. Then select “Upload from device”.
4. Navigate to where you stored the .kml file with your sampling units (check your downloads folder if you did not save the file elsewhere). Select the .kml file and click “Open”. Google Earth will create points on the map and automatically zoom into your locations.

View your Sampling Units in the USGS National Map (no account required)

1. On your web browser, go to https://apps.nationalmap.gov/viewer/
2. In the column of icons on the right-hand side, click the “Add Data” icon. 
3. At the top of the box, click on the “File” heading. Click on “Browse” and navigate to your .kml file (check your downloads folder if you did not save the file elsewhere). Close the “Add Data” box.
4. Your points should now be on the map. Zoom in to explore further.

Extra Credit
Exercise B:

Species Checklists and Area Search

Notes

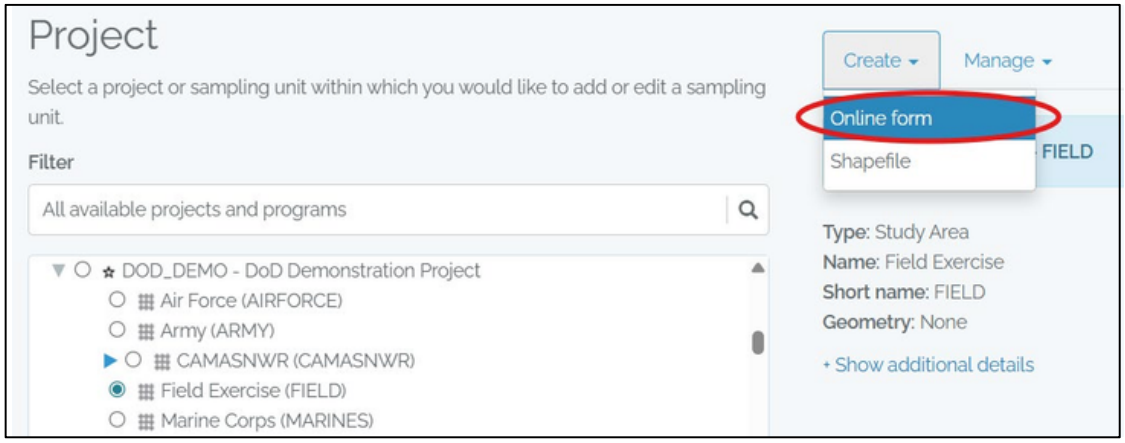
Exercise B: Species Checklists and Area Search

Purpose: The purpose of this exercise is to learn how to create Area Search sampling units and enter Area Search data, while getting familiar with a different type of data structure in the AKN. You'll be collecting a Species Checklist in the field during the Field Exercise using the data sheet attached. (If your training schedule does not include the Field Exercise, you can use this sheet to conduct a Species Checklist on your own). Species Checklists can be entered in the AKN using an Area Search protocol.

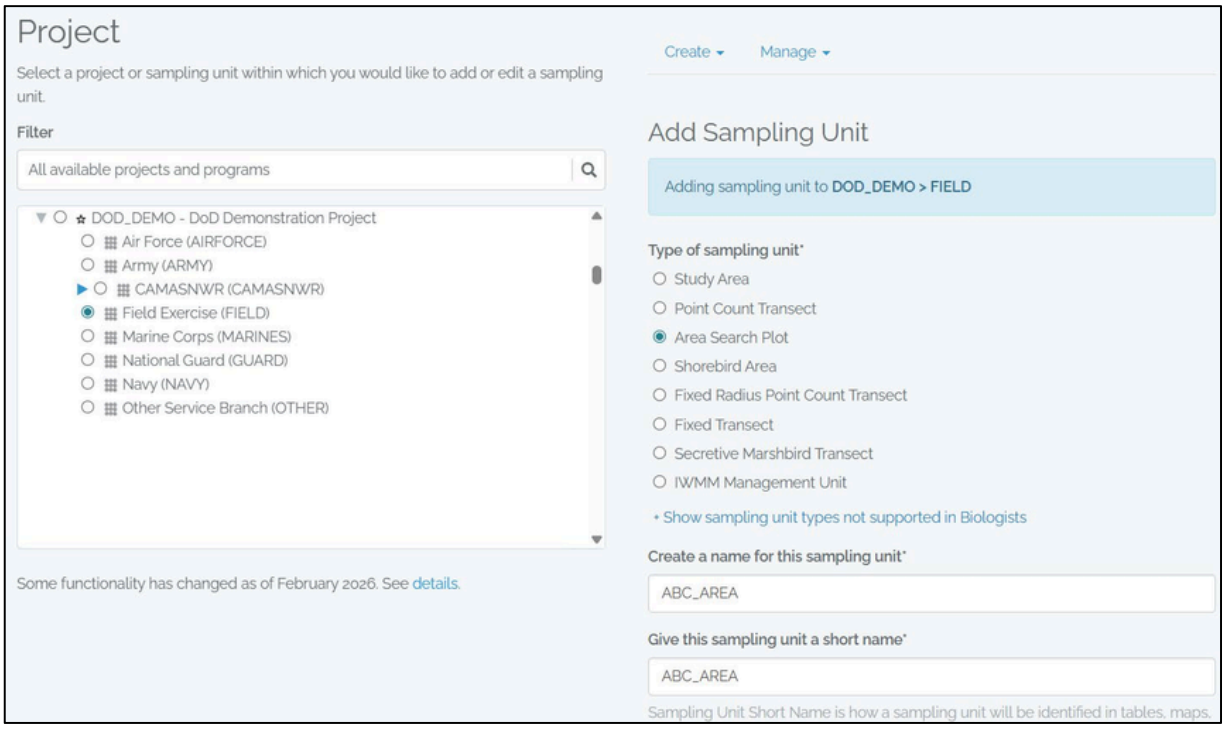
Thinking Ahead: Collecting comprehensive species checklists is one easy way to gather incidental species observations between surveys. They can occur simultaneously with point count surveys to ensure species that might not be observed during a point count are still recorded, and to create a comprehensive list of all the species that were observed on a given day.

Step 1: Create an Area Search Plot sampling unit

1. Navigate to the **Project Leader** application and log in if needed. (You can find a link to the Project Leader application on the DoW AKN Portal, www.dodakn.org, under the "*Manage Data*" tab.)
2. Under "*Sampling Units*" click on **Create and Manage.**
3. Click the blue arrow next to the **DOD_DEMO** project to expand the sampling unit hierarchy within this project.
4. Find the "Field Exercise" Study Area and click to select it. (You can select any Study Area as an alternative if "Field Exercise" is not available).
5. Once selected, click the "**Create**" and "**Online form**" options on the right side.

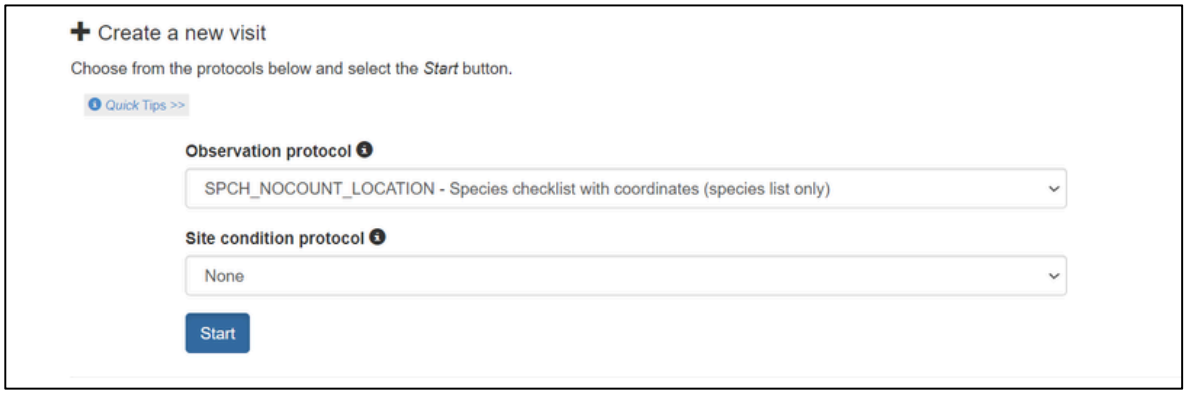


6. For *Type of sampling units*, select **Area Search Plot (Area)**.
7. Fill in the information about your Area Search Plot
    a. Create a name for this sampling unit: Use the Point Count Transect name you created in in Exercise 1 + “Area”. (e.g. ABC_AREA)
    b. Give this sampling unit a short name (you can reuse the name, e.g. ABC_AREA).
    c. Skip the other fields for now, and click the **Add Sampling Unit** button at the bottom **right** of the screen**.**
    d. You should see your new Area Search Plot in the list of sampling units on the left.



Step 2: Enter Species Checklist data

1. Navigate to the **Biologist** application and log in if needed. (You can find a link to the Biologist application on the DoW AKN Portal, www.dodakn.org, under the “Manage Data” tab.)
2. Select the project on the left, **DOD_DEMO.**
3. Click on “**Area Search Surveys**” in the list on the right.
4. Find the Area Search Plot you created in Step 1 and click on it.
    a. Under “Create a new visit”, select **SPCH_NoCount_Location** for Observation protocol. Leave the Site Conditions Protocol as “None.” Click the **Start** button.



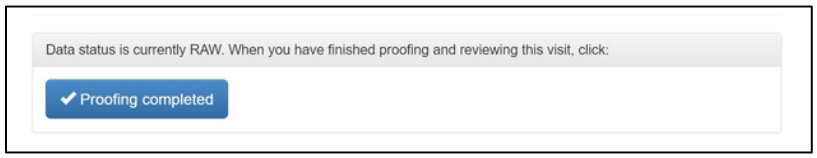
5. Fill out the screen using the information on your datasheet (see Attachment A).
    a. **Date** - use the calendar to select a date; or enter month, day, and year in any format. It will automatically be converted to yyyy-mm-dd.
    b. **Start Time** - can be entered as 24-hour hh:mm, military time, or 12-hour h:mm followed by AM or PM.
    c. **End Time** – (same as above)
    d. **Visit** - 1
    e. Data sharing level - set to RAW and cannot be changed.
    f. **Observer** - anyone in the project (all those in the class) can be selected.
    g. **# other Observers** - default is 0
    h. Other Observer names - you can leave this blank if not applicable
    i. **Notes**- can be used to provide context

6. Under **Observations** enter your data:
    a. **Species**—Enter 4-letter species codes. Search the species database if you don't know the 4-letter AOU code. Note that species names may or may not automatically populate as you start typing; both are normal.
    b. **Latitude/Longitude**—Leave blank unless you recorded something here
    c. **Notes**—if applicable

7. Click **Save All** when finished.
    a. If you made any errors or forgot to fill in a required field, you will get a red message at the top of the screen. Go correct the error and click the “Save to Database” button again.
    b. If you are successful, you will see a green message at the top of the screen.

8. After saving to the database, you will be taken to the proofing page. Review what you entered to confirm the information was entered correctly. It’s particularly useful to check the species list at the bottom (it will list the common and scientific names for all the species you entered on the survey) to make sure you recorded the correct species codes.

    a. If you find a mistake, you can double click on the field to make corrections.
    b. Click the **Add more** button if you forgot to add a line, such as an entire species, to the event.
    c. When you are satisfied, click the **Proofing Completed** button near the top of the page.



    d. Your survey is complete. You will see your survey in the list of visits, and the Data Sharing Level should be set to CLEAN.

Attachment A: Species Checklist Datasheet

Species Checklist

Site _____ Observer _____

Date _____ Add'l Observers (#) _____

Start time _____ Initials: _____

End Time _____

Species	Coordinates (Optional)*

Species	Coordinates (Optional)*

Notes:

*Coordinates can be written in any format, but must be converted to WGS84 (Latitude/Longitude) to enter into the AKN.

Notes

Extra Credit

Exercise C:

Using the Protocol Search Tool

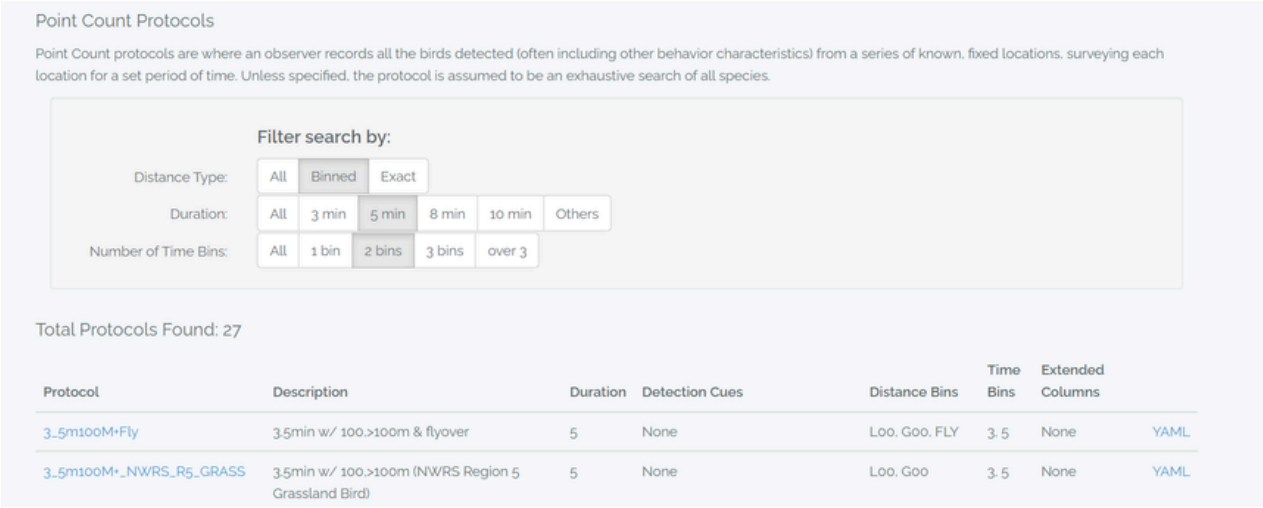
Notes

Exercise C: Using the Protocol Search Tool

Purpose: The purpose of this exercise is to learn about the different Protocol types in the AKN and get familiar with how to search for a Protocol that already exists. You can also practice adding a Protocol to a project.

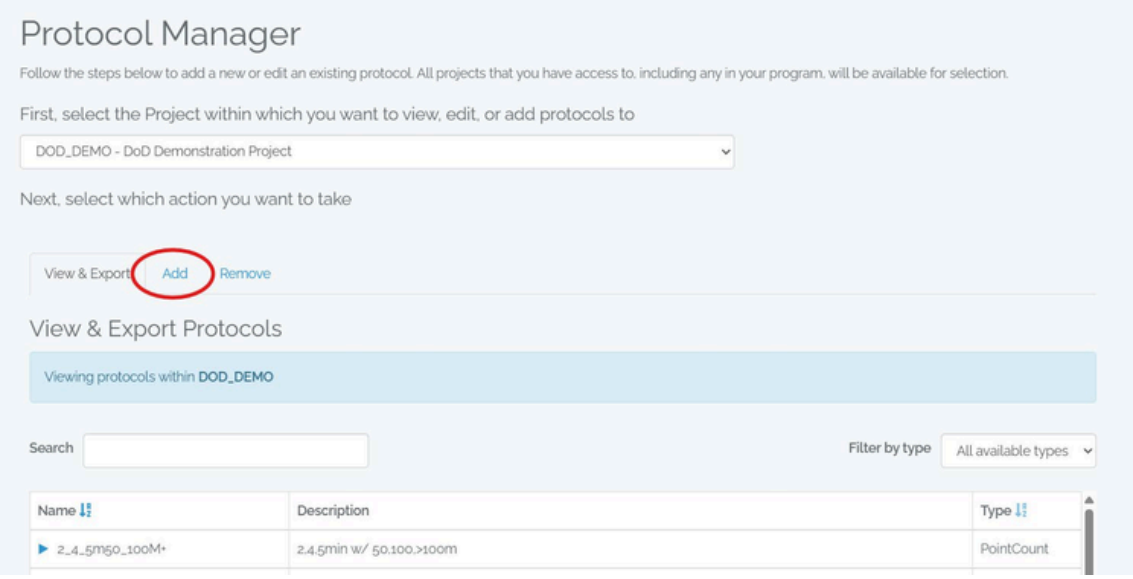
Thinking Ahead: There are many Sampling Protocols already available in the AKN, but we also can create new ones. It is easiest to create a new Protocol if users find an existing Protocol that closely matches the survey methods first.

1. Navigate to the **Advanced Protocol Search** tool and log in if needed. (You can find a link to the Advanced Protocol Search tool on the DoW AKN Portal, www.dodakn.org, under the “Manage Data” tab.)
2. Under “Search” you can select a protocol type. Select “**Point Count**”.
3. You can filter your search by distance type, duration, and number of time bins. Try filtering the protocols using these features.
4. After filtering, notice the list of protocols that match your criteria. Each protocol includes some information about the duration, the detection cues used, distance bins, time bins, and whether there are any additional fields (“Extended Columns”).
5. Click on the hyperlink of a protocol that interests you to learn more about it. The Sampling Protocol Definition page will list the codes for each field and a description for each code.
6. If you want to add a protocol to your project, record the name of the protocol so you can find it later. Pay close attention, as many protocols have similar naming conventions.



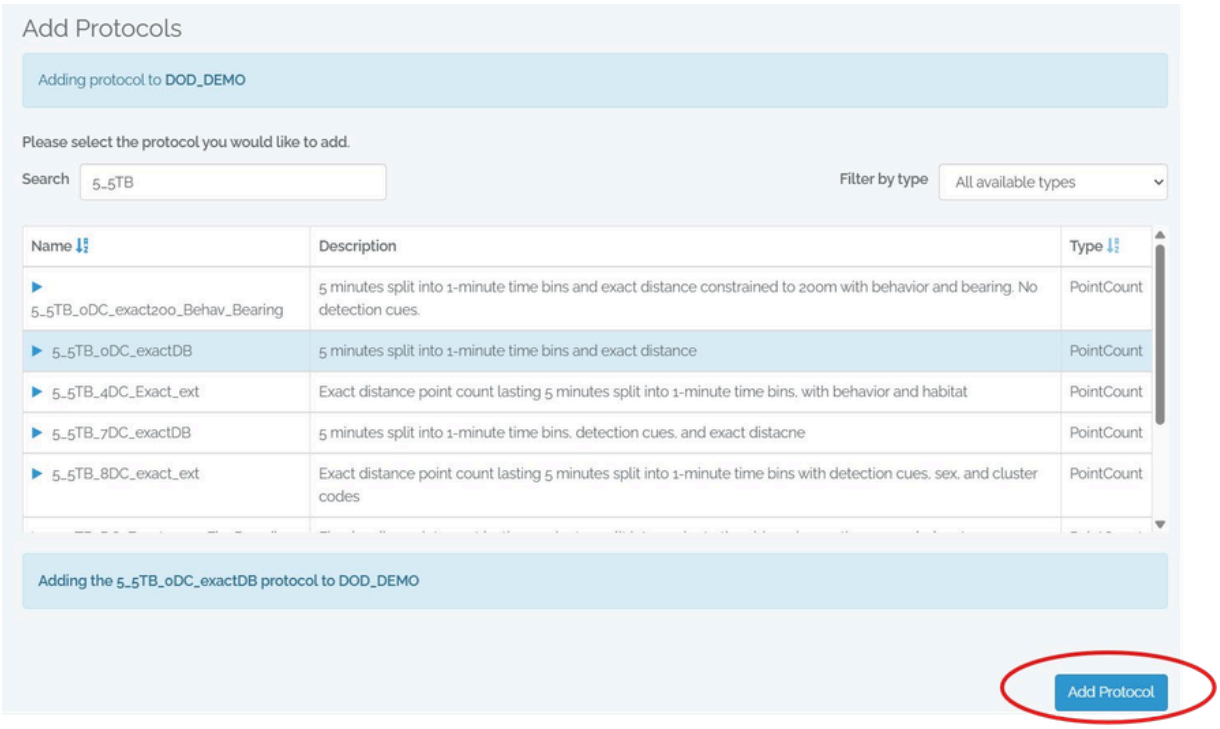
To add a protocol to your project:

1. In the **Project Leader** Application, under "Project Definition," click on **"Protocols Used"**
2. Select your project **DOD_DEMO**.
3. You will see a list of all the protocols that are currently in the project. To add an additional protocol, click the "**Add**" button.

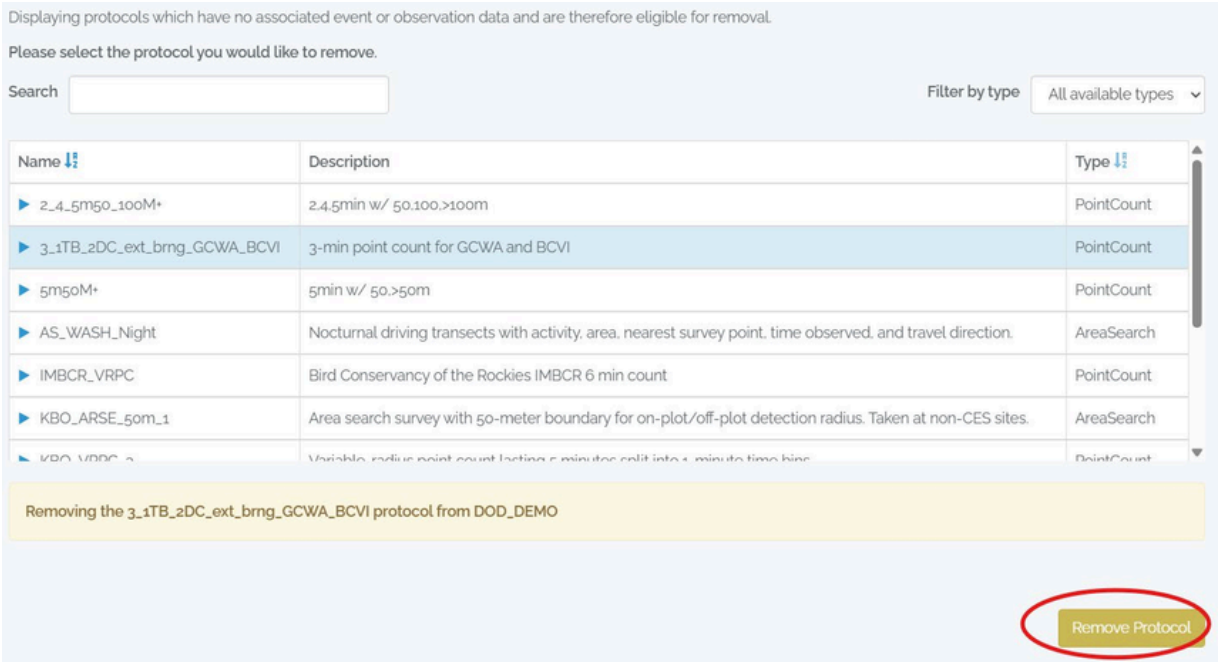


Protocols are listed in alphabetical order. You can use the search bar to find protocols by name. Use the "Filter by Type" option to shorten the list to just protocols of a particular type. Select the blue arrow next to a protocol name to view more information about the protocol.

4. Select a Protocol and click "**Add Protocol**."You will now see the protocol in the View & Export Protocols list.



5. You can delete protocols from your project if they are not attached to any data. Click the "Remove" tab, select the protocol you want to delete, and click "**Remove Protocol**". Once data has been entered using a protocol, the protocol cannot be removed.



Notes

Extra Credit

Exercise D:

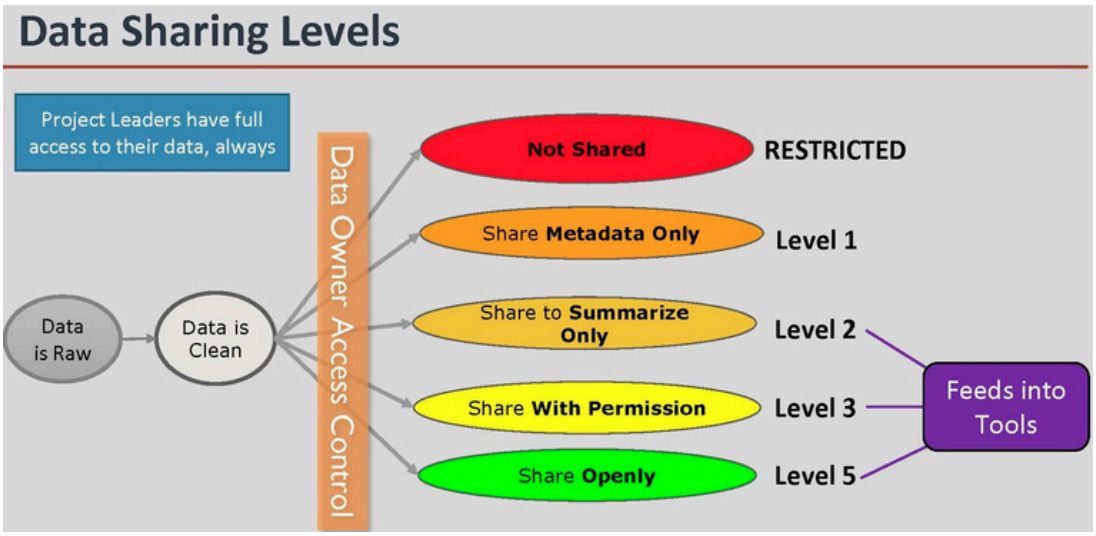
Setting Data Sharing Levels

Notes

Exercise D: Setting Data Sharing Levels

Purpose: This exercise will show you how to set data sharing levels for your data. You can change the data sharing levels for any sampling event in your project at any time.

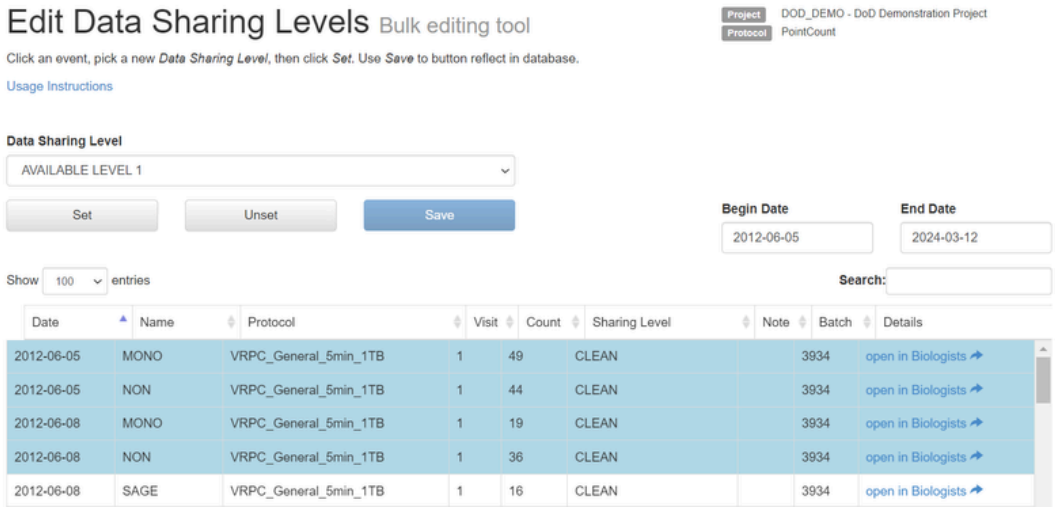
Thinking Ahead: Data sharing is automatically set to "CLEAN" after the data have been entered and proofed. After that, a Project Leader must manually change the data sharing levels so the desired amount of information about the data is shared and Biologists can no longer edit the data. For your data to appear in tools, such as Observation Map, it must be set to Level 2 or above.



Setting Data Sharing Levels

1. Navigate to the **Project Leader** application and log in if needed. (You can find a link on the DoW AKN Portal, www.dodakn.org, under the "Manage Data" tab.)
2. Under the "Field Observations" heading, click on "**Set Data Sharing Levels**".
3. Use the drop-down box to select your project **DOD_DEMO.**
4. Under "Available Protocols" click on "**Point Count**".
5. Find the Date and the sampling unit Name of a visit you entered in the list and click to highlight it. (Note, you can select multiple events by using CTRL+Click, or SHIFT + Click if the visits are consecutive). You can filter by date or by a search term using the boxes on the right-hand side.

6. With your events highlighted, use the drop-down menu at the top to select the **"Available Level 1"** data sharing level.



7. Click the "**Set**" button. You'll notice that the sharing level has been changed from "CLEAN" to "AVAILBLE LEVEL 1" on the events you highlighted.
8. If the changes look how you expect, click on the "**Save**" button to update the database.

Note that data changed to level 2 or above will not be immediately visible in the AKN tools. The data must go through the overnight ETL process first.

About Data Sharing Levels

The following are the Avian Knowledge Network's Data Sharing Levels. These are applicable to each and every record in the network individually, so that different sampling events may have different sharing levels. Data published under one of the five Data Sharing Levels below are stored in the AKN's primary data warehouses. The warehouses serve as the primary archives of all AKN data. Data owners can specify how their data can be used in the data views, with the option that their data are fully hidden/restricted (not exposed at all).

RAW – Data initially input into the AKN that has not been reviewed for accuracy (i.e. Proofing page was not completed during data entry). This data cannot be used in any analysis and is not available in the AKN Data Warehouse for download. Data are waiting for either Biologist or Project Leader approval to be elevated to CLEAN. Only the contributing institution has access to data at this level.

CLEAN – Data input into the AKN was reviewed for accuracy and accepted as valid. The data will be copied into the AKN Data Warehouse for download by those affiliated with the project via the Data Downloader. The data are also available for use by the AKN Analyst Tool. The data

are waiting for Project Leader approval of elevation to higher sharing levels. Only project members have access to data at this level.

APPROVED – Data are available for use by the contributing institution (those associated with a project at the Biologist and Project Leader roles). Data are copied into the AKN Data Warehouse for download by those affiliated with the project.

RESTRICTED – Information about Restricted records is not shared with any AKN tools. Only the contributing institution has access to data at this level.

LEVEL 1 – Metadata about Level 1 records will be made available in a future data discovery tool. However, records are not used in any other AKN tools. Only project members have access to data at this level.

LEVEL 2 – Same as Level 1 with the following addition: data can be used in certain publicly available, predefined visualizations (i.e. maps and graphs), but direct access to the data is restricted.

LEVEL 3 – As with Level 2, data are used in publicly available, predefined visualizations (i.e. maps and graphs), and metadata will be made available in a future data discovery tool. Additionally, the complete event dataset is available upon request, subject to approval from the original data provider.

LEVEL 4- This level is not currently applicable.

LEVEL 5 – Full public accessibility. Data are used in online publicly available AKN tools (Observations Map and mapping tools, Phenology Tool, and IPaC). Common data fields from all observation types and protocols are available for download via the AKN Data Downloader without needing to wait for permission. Data at this level can be acquired without restriction by researchers requiring data to perform analyses.

Notes

Extra Credit

Exercise E:

Downloading Data

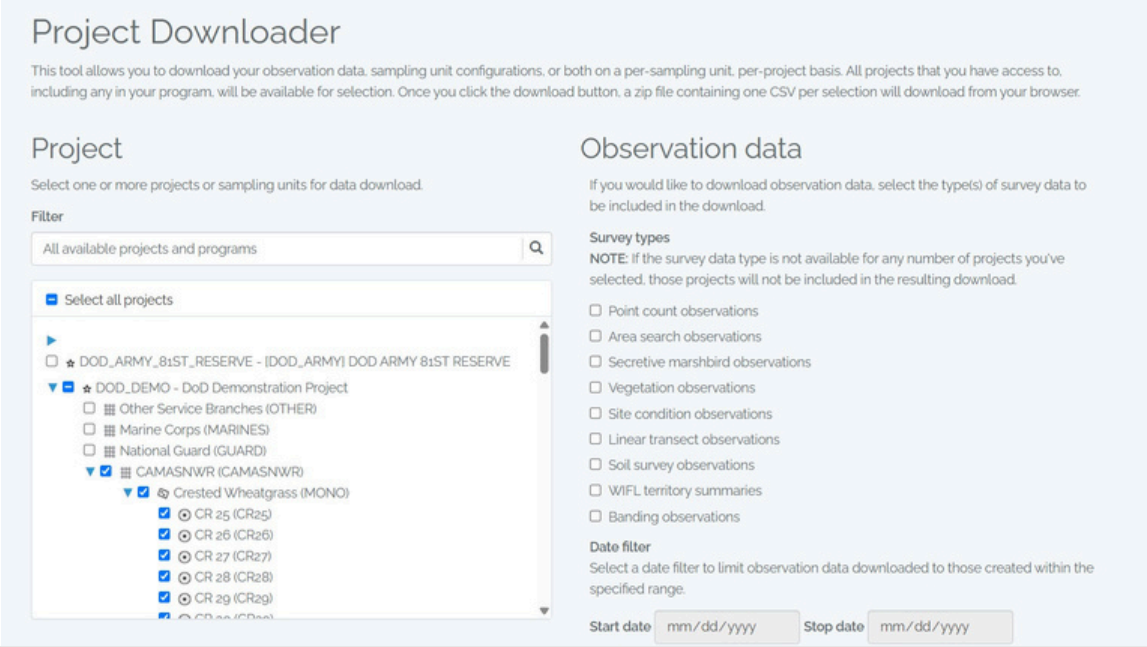
Notes

Exercise E: Downloading Data

Project Leaders can download the data in the AKN Project at any time, no matter what Sharing Level it is assigned to. Data downloaded from Project Downloader includes the full dataset, not the smoothed data that is stored in the warehouse, so it will include all extended fields, original distance bins, etc.

If you have Project Leader access, you may use the Project Downloader application to retrieve data. This application allows a user to download data from multiple projects at a time, in separate files. These data will include all fields described in the sampling protocols used.

1) Navigate to the Project Downloader application and log in if needed. You can find a link on the DoW AKN portal (www.dodakn.org) under the "Manage Data" tab. Scroll down to "Discover Data" and select "**Raw Data Download**".
2) On the left-hand side, select the blue triangle icon next to the project you would like to download data for. You can continue clicking blue triangle icons to further expand the Sampling Unit tree.
3) Click the boxes next to the Sampling Units you would like to download data for. Clicking a box of an overarching Sampling Unit (e.g. a Study Area) will automatically select all of the sampling units nested below it.
4) Under "Observation data", select the type(s) of data you would like to download (e.g. Point count observations, Area search observations). Under "Date filter", you can specify dates (year-month-day) to filter by or leave these boxes blank for all records.
5) Scroll down to the bottom and click the blue "**Download**" button.

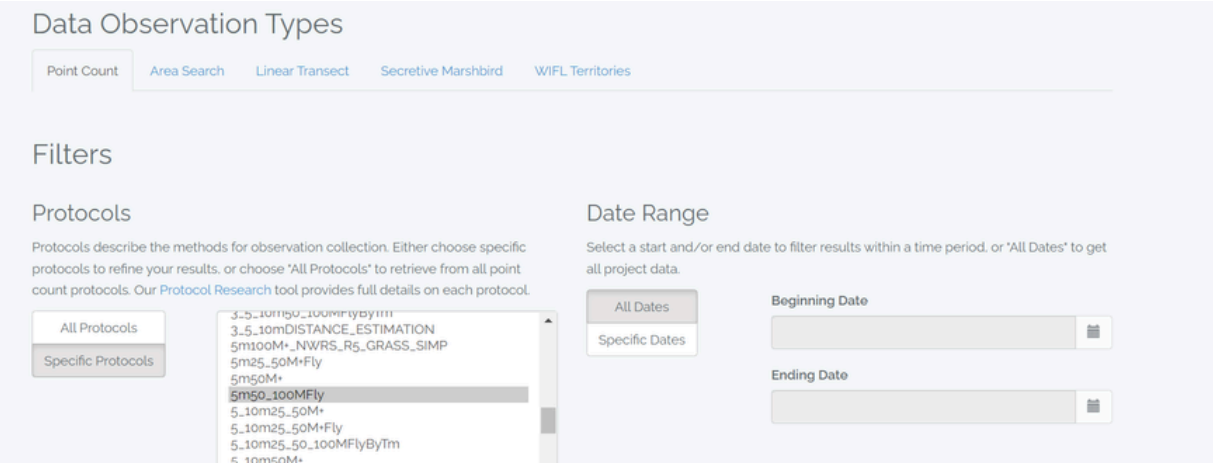


Now, compare the data file you just downloaded to the data you can download in the data downloader:

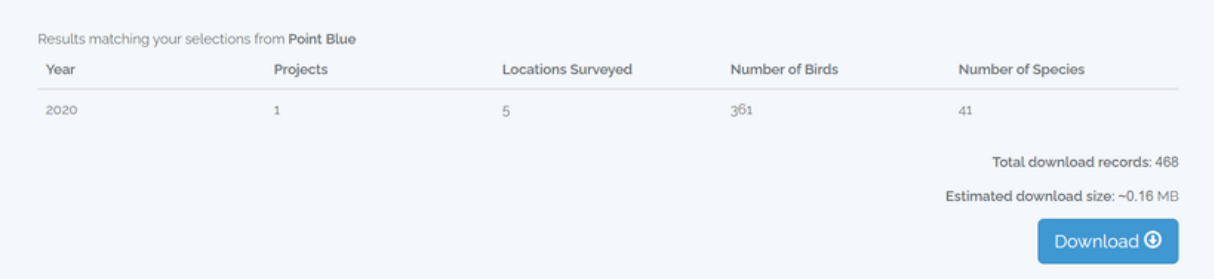
1) Navigate to the Data Downloader application and log in if needed. You can find a link on the DoW AKN portal (www.dodakn.org) under the "Manage Data" tab. Scroll down to "Discover Data" and click on "**Public Data Download**".

2) Select the observation type (e.g. Point Count or Area Search) from the tabs under "Data Observation Types". Then, filter for the data you wish to download. You'll notice that you have several options:
   a) **Protocols**—if you know the AKN sampling protocol(s) that are relevant to your download. If not relevant, select "All Protocols". For this exercise, try selecting the protocol "5m50_100MFly".
   b) **Date Range**—You can either filter by a date range or select "All Dates".
   c) **Species**—You can select one or more species (select multiple species by holding Ctrl and clicking on each species name).
   d) **Regions**—To filter by region, first select a region type (for example, US States). Then select the region(s) to filter by. Select multiple regions by holding Ctrl and clicking on each region name.
   e) **Project**—You have the option to download data from all the projects you are a project leader on, plus data from other projects that are set to Sharing Level 5. You can select one or more projects to download data from with this filter.

Note that narrowing your search using one or more filters is recommended to decrease the amount of time needed to create a download file in the next step.



3) After selecting some filters, click " **Search**" and then "**Download**" to download a CSV of the filtered data.



Results matching your selections from **Point Blue**

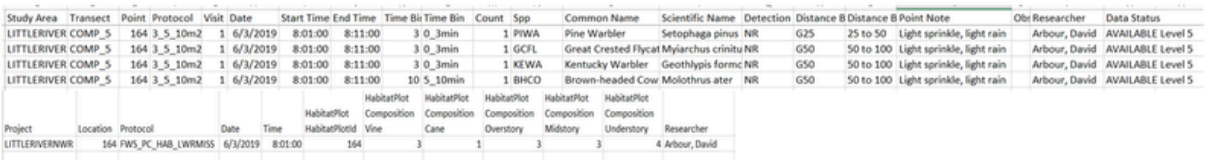
Year	Projects	Locations Surveyed	Number of Birds	Number of Species
2020	1	5	361	41

Total download records: 468

Estimated download size: ~0.16 MB

Download

4) Look at the observation time fields and the distance fields in both datasets. How are they different? Data downloaded from the Data Downloader is **Warehouse** data, which means that it has been "smoothed" so that data from different protocols can be used in the same analysis. In contrast, you'll notice that the data you download from Project Downloader is the **Project Database** data, and will look exactly how you entered it.



Study Area	Transect	Point	Protocol	Visit	Date	Start Time	End Time	Time Bi	Time Bin	Count	Spp	Common Name	Scientific Name	Detection	Distance B	Distance B	Point Note	Obs	Researcher	Data Status
LITTLERIVER	COMP_5	164	3_5_10m2	1	6/3/2019	8:01:00	8:11:00	3	0_3min	1	PIWA	Pine Warbler	Setophaga pinus	NR	G25	25 to 50	Light sprinkle, light rain		Arbour, David	AVAILABLE Level 5
LITTLERIVER	COMP_5	164	3_5_10m2	1	6/3/2019	8:01:00	8:11:00	3	0_3min	1	GCFL	Great Crested Flycat	Myiarchus crinitu	NR	G50	50 to 100	Light sprinkle, light rain		Arbour, David	AVAILABLE Level 5
LITTLERIVER	COMP_5	164	3_5_10m2	1	6/3/2019	8:01:00	8:11:00	3	0_3min	1	KEWA	Kentucky Warbler	Geothlypis formc	NR	G50	50 to 100	Light sprinkle, light rain		Arbour, David	AVAILABLE Level 5
LITTLERIVER	COMP_5	164	3_5_10m2	1	6/3/2019	8:01:00	8:11:00	10	5_10min	1	BHCO	Brown-headed Cow	Molothrus ater	NR	G50	50 to 100	Light sprinkle, light rain		Arbour, David	AVAILABLE Level 5

Project	Location	Protocol	Date	Time	HabitatPlot HabitatPlotId	HabitatPlot Composition Vine	HabitatPlot Composition Cane	HabitatPlot Composition Overstory	HabitatPlot Composition Midstory	HabitatPlot Composition Understory	Researcher
LITTLERIVERNWR	164	FWS_PC_HAB_LWRMISS	6/3/2019	8:01:00	164	3	1	3	3	4	Arbour, David

Project Database Version

Warehouse Version

GlobalUniqueIdentifier	ProjectCode	ProjectName	LocalityID	StudyArea	Transect	TransectName	Point	SamplingU	ParentSam	Samp
URN:catalog:PRBO:LITTLERIVERNWR.300600.PointCount.3_5_10m25_50_100MFlyByTm.329406.1	LITTLERIVERNWR	Little River NWR	LITTLERIVERNWR:COMP_5	Little River NWR	COMP_5	Compartment_5	164	300600	348115	Point
URN:catalog:PRBO:LITTLERIVERNWR.300600.PointCount.3_5_10m25_50_100MFlyByTm.329406.2	LITTLERIVERNWR	Little River NWR	LITTLERIVERNWR:COMP_5	Little River NWR	COMP_5	Compartment_5	164	300600	348115	Point
URN:catalog:PRBO:LITTLERIVERNWR.300600.PointCount.3_5_10m25_50_100MFlyByTm.329406.3	LITTLERIVERNWR	Little River NWR	LITTLERIVERNWR:COMP_5	Little River NWR	COMP_5	Compartment_5	164	300600	348115	Point
URN:catalog:PRBO:LITTLERIVERNWR.300600.PointCount.3_5_10m25_50_100MFlyByTm.329406.4	LITTLERIVERNWR	Little River NWR	LITTLERIVERNWR:COMP_5	Little River NWR	COMP_5	Compartment_5	164	300600	348115	Point

DecimalLatit	DecimalLon	Visit	ProtocolCode	Observatic	YearCollec	Month	DayC	JulianDa	JulianDayV	P	Time	Collec	ScientificN	CommonN	SpeciesCo	Phylogent	DistanceFr	Flyc	I	Detectic	E	Observa	NoObse	RecordPermissions
33.9699705	-94.70262	1	3_5_10m25_50_100MFlyByTm	6/3/2019	2019	6	3	154	75		8:01:00	DA	Setophaga	Pine Warb	PIWA	1696	37.5		NR		1	0	AVAILABLE LEVEL 5	
33.9699705	-94.70262	1	3_5_10m25_50_100MFlyByTm	6/3/2019	2019	6	3	154	75		8:01:00	DA	Myiarchus	Great Cres	GCFL	1254	75		NR		1	0	AVAILABLE LEVEL 5	
33.9699705	-94.70262	1	3_5_10m25_50_100MFlyByTm	6/3/2019	2019	6	3	154	75		8:01:00	DA	Geothlypis	Kentucky \	KEWA	1718	75		NR		1	0	AVAILABLE LEVEL 5	
33.9699705	-94.70262	1	3_5_10m25_50_100MFlyByTm	6/3/2019	2019	6	3	154	75		8:06:00	DA	Molothrus	Brown-hea	BHCO	2015	75		NR		1	0	AVAILABLE LEVEL 5	

Notes

Office Hours Prep

Avian Data Questionnaire

Notes

Office Hours: Project Set Up in the AKN

New Project Questionnaire

Name:

Installation:

Email Address:

1) Please provide a short summary of the scope of your project. What are the objectives/questions for your project?

2) What survey type do you conduct? (e.g., Point Count, Area Search, Line Transect, etc.)

3) **Sampling Units**: How are your surveys organized? How do you select your sampling locations? Briefly describe your study design.

   a. If point counts, are they grouped into transects, or are all points independent? Y or N

4) **Observation Protocol**: Describe your field methods. Do you have a written protocol or data dictionary? Y or N
   a. Species -
   b. Length of survey –
   c. Time Bins –
   d. Distance—exact or binned? –
   e. Detection cues—do you record this? Y or N
      - If so, what detection cues do you use (e.g., call, song, visual, wing, etc.)?
      - If so, all types or just first detected?
   f. Do you do any repeat counts? –
   g. Do you record incidental observations? –

5) **Site Condition Protocol**: Do you collect any weather or habitat data? If so, what do you collect?

6) After your historic data is in the AKN, do you plan to enter your data directly into AKN (recommended), or will you need to bulk upload your data regularly (e.g., if your data is collected digitally via eBird, Survey 123, etc).

Visit the DoW AKN Portal to schedule an Office Hours Appointment:
https://www.dodakn.org/office-hours-booking-page/

Notes

AKN Glossary for DoW

Notes

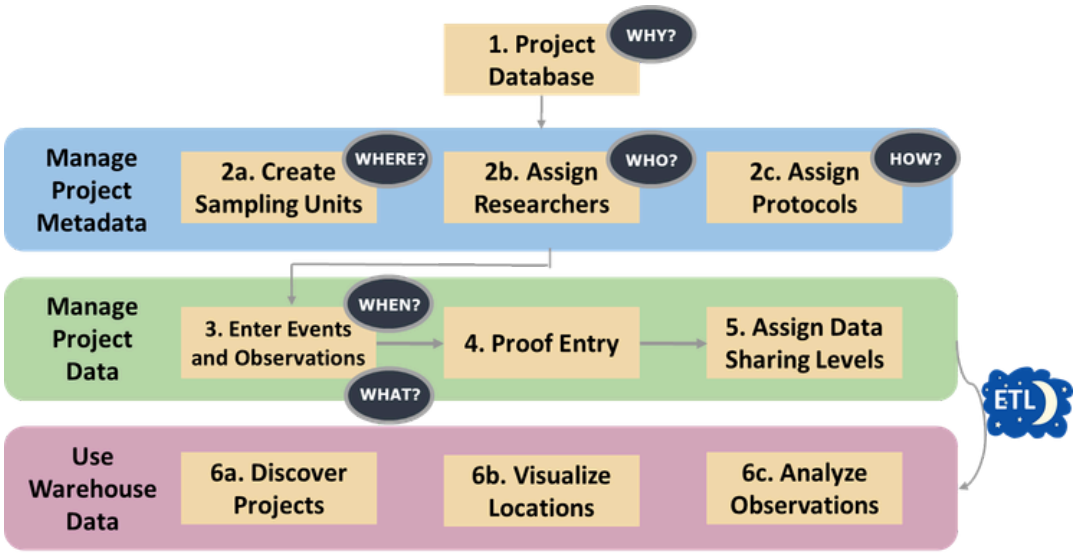
AKN Glossary for DoW

Users access levels (Note: to obtain any level of user access in the AKN, you must first register for a user account. Please visit https://www.dodakn.org/new-users/ to find your project name and create a new user account.

The AKN allows for multiple levels of access to enter, manage, and share data. AKN users are assigned a User Role associated with each AKN Project they have permission to access. Current User Roles include:

- **Biologist**: An AKN user assigned as a Biologist in an AKN Project can enter and proof data. Biologists can also review, edit, or correct previously entered data in any dataset housed within the AKN Project.
- **Project Leader**: In addition to all Biologist User Role capacities, AKN users assigned as a Project Leader in an AKN Project can assign Sampling Protocol Definitions to an AKN Project, manage the Sampling Units (areas, points, transects, etc), manage data, get full exports of the AKN Project data from the system, and manage the User Roles (Biologist or Project Leader) of other AKN users on the AKN Project. Project Leaders can also set the desired data sharing levels for data, which determines how the data will appear in the various tools in AKN.

Data Management Terms:



AKN Project: Fundamental unit of organization for observation data within the AKN. Projects contain information about how (Sampling Protocols), who (Researchers and Users), where (Sampling Units), when (Sampling Events), and what (Sampling Event Observations) data are collected. For DoW, each installation has its own project.

Sampling Unit: Field location where research or a survey is conducted and samples (observations) are collected. Sampling units are arranged hierarchically within AKN Projects (e.g. point count points nested

within a transect). Sampling Units contain a location name and geometry that describes where it sits on the earth. All point, polygon and other geographic data are described in WGS-84 Latitude-Longitude (EPSG:4326) geographical coordinate system.

Researcher: A person's name stored in the AKN assigned to a Project(s) by the respective Project Leader(s) and is identified with collecting observations. A Researcher does not have an AKN user account and therefore cannot enter or proof data, but an individual who is registered either as a Biologist or Project Leader can enter data on behalf of the Researcher under the researcher's name.
Sampling Protocol: Defines how the data were collected and how they are stored. This includes extended field names, domains, and any rules built into the data structure.

Sampling Event: Represents the survey itself with a unique combination of location, date and time, person/people, and the protocol employed.
Sampling Observation: Observations made at a sampling event; these observations will differ depending on the specific AKN protocol being used, but will contain some core fields such as species and count.

Sampling Protocol Types:

- **Area Search:** An observer records all the birds detected (often with other behavior characteristics) within a specific boundary in a recorded period of time. Area search protocols include start and end times, the species observed, and can also include a count, detection cues, or breeding behaviors. Area search protocols are flexible and can be adapted to a wide variety of surveys, and are often used to enter comprehensive species checklists. Unless specified, the protocol is assumed to be an exhaustive survey of all species.
- **Point Count:** An observer records all the birds detected (often including other behavior characteristics) from a series of known, fixed locations, surveying each location for a set period of time. Point count protocols include the duration of the survey, how the time is binned, and often include distance (binned or exact), detection cues, or breeding behavior. Unless specified, the protocol is assumed to be an exhaustive survey of all species and that each animal is counted once.
- **Linear Transect:** An observer moves along a path recording all the birds detected (often with other behavior characteristics) along the way in a recorded period of time. Linear Transects are done either on foot or in a vehicle (airplane, boat, etc). Unless specified, the protocol is assumed to be an exhaustive search of all species.
- **Secretive Marshbird:** Secretive Marshbird protocols follow the Conway National Protocol Framework for surveying species at points using a predefined playback sequence
- **Site Conditions:** Site Condition protocols are used in conjunction with another protocol type (Point Count, Area Search, etc_ for recording covariate characteristics about the landscape at or around a sampling location at a give date and time. Site condition fields apply to the entire sampling event, not just a single observation or record and can include fields such as weather conditions, vegetation cover, and disturbance. Site conditions protocols can be applied to multiple projects if desired.

Data Sharing Levels: Each observation available in the AKN is tagged with a data sharing level as determined and set by the data owner (project leader). The AKN provides multiple data sharing levels (full details can be found on the Data Sharing Level (https://avianknowledge.net/index.php/data- sharing-levels/) page.

Core fields: Fields that are automatically associated with a protocol, either in the event or observation table. Some core fields are required (i.e., set by the AKN) and others are not and can be suppressed so they do not show up on the user interface. Example core fields that are required are species and count.

Extended fields: Custom fields that are specific to your database. Extended fields may apply to a site condition protocol or an observation protocol. Once created, extended fields can be used in multiple protocols within the same protocol type (e.g. area search, point count). Extended fields are included in the project warehouse and will be part of the data downloaded through the Project Leader application, but will not be included in the AKN tools such as the Data Downloader or the Analyst.

Project data: Project data includes all the data as you entered it into you project. This includes all extended fields, the original distance bins, etc that are included in the protocol you use.

Warehouse data: Warehouse data has been formatted to fit a standard format that allows for data collected with different protocols to be analyzed together. Warehouse includes all core fields (e.g., species, count, time) and some "smoothed" fields. For example, distance bins are replaced with averages of the range of the bin to make the data comparable with protocols that record exact distance. Extended fields are not included in warehouse data.

Notes