USGS

Patuxent Wildlife Research Center

North American Bird Banding Program - Bird Banding Laboratory

Summary

Bird banding is important to the evaluation of species management assessments and actions, such as hunting regulations, manipulation of habitats, and monitoring species of concern as well as threatened or endangered species. Individual banding and identification of birds assists in further understanding of species dispersal and migration, behavior and social structure, lifespan and survival, population and productivity, toxicology and disease, and harvest vulnerability. In order for the Bird Banding Laboratory (BBL) to be successful in continuing its support of conservation and management of birds, users need an intuitive and efficient way to report banded bird encounters while reducing error rates and enhancing the quality of information received. In addition to reporting data, some user groups need easy access to data reports for research relevant to bird conservation and

management. All banding data is potentially valuable, so access to this needs to be intuitive and data output needs to be customizable. The intent of this report is to provide recommendations to enhance the current BBL Encounter Form as well as a way to integrate a Data Request and Search for users to obtain summaries of banding and encounter data.

Report a Bird Band or a Marked Bird

In order for bird banding to be effective, encounters of banded birds need to be reported back to the BBL. Encounters may include resighting, recapture, or recovery of a marked bird, alive or dead, after the initial banding. In addition to scientists, encounters may be reported by both avid bird watchers as well as those with limited knowledge about birds. It is important to consider all three of these user groups when enhancing the existing Encounter Form in order to provide an optimized user experience regardless of background. It is equally important to capture the appropriate data needed for future analysis and reduce user error. The following wireframes account for a diverse user group while keeping the goals of the Encounter Form in mind.

Create a Report

1. Log In, Create an Account, Report as a Guest

Anyone can create an account. It's anticipated that those who do will typically be scientists and avid bird watchers with the remaining users opting to complete the form as a guest. Those who choose to be a guest user will be asked to fill in their contact information, but the system also allows them to create a BBL account directly from the current screen. At that point the necessary components display.

A	Username	Text input	Required	Username will be the user's email address.
B	Password	Password input	Required	User input is masked when they are typing. When user enters text into the field, an eye icon appears at the right side of the field that allows the user to see the text they are entering.
C	I forgot my password	Link		Navigates the user to the "Reset Password" flow
D	Remember me on this device	Checkbox	Optional	When the user checks this box before submitting the form, the user's email will be pre-populated when they return to the login screen on the same device.

E	Log Into Your Account	Button		Logs in the user and redirects to the user dashboard.
F	Create a BBL Account	Button		Redirects the user to the create an account form
G	Create a Report as a Guest	Text Link		Takes the user to report form without requiring a login or account creation

2. Create a New BBL Account

A	Already have a BBL account? Sign in Here	Text Link		Navigates user to the login form (screen 1).
B	First Name	Text input	Required	
C	Last Name	Text input	Required	

D	Email address	Text input	Required	Validate for proper email formatting
E	Daytime phone	Text input with pre-formatted area code and dash	Optional	As the user types into the field, the area code parentheses and dash are pre-populated.
F	Please select all of the options that apply to you	Checkbox group	One selection is required	Options for checkboxes: • I am the finder or am reporting on behalf of the finder. • I am a bird bander or a bander's assistant. • I am Federal, State, or Provincial official.
G	Permit number	Text input	Optional as international permits are not accepted.	Visible if "I am a bird bander or a bander's assistant." is selected for Component F on screen 2.
H	Street Address	Text input	Optional	Text input utilizes the Google Maps API, when the user begins typing their address, they are presented with address options in a typeahead. When an address is selected from the dropdown, the entire address form is populated. An example of this api can be found at: https://developers.google.com/maps/documentation/javascript/examples/places-autocomplete-addressform
I	Address Line Two	Text Input	Optional	Will be populated by Google Maps API. Resulting address can be overwritten.
J	City	Text Input	Optional	Will be populated by Google Maps API. Resulting address can be overwritten.
K	State	Text Input	Optional	Will be populated by Google Maps API. Resulting address can be overwritten.
L	Zip / Postal	Text Input	Optional	Will be populated by Google Maps API. Resulting address can be overwritten.
M	Password	Password Input	Required	User input is masked when they are typing. When user enters text into the field, an eye icon appears at the right side of the field that allows the user to see the text they are entering. As user types into the fields, a popover appears below the input that informs the user of the password requirements. As the requirements are met, each line of the popover will have a visual feedback that informs the user that they have met that criteria (for example, a red "X" changes to a green check).
N	Confirm Password	Password Input	Required	User input is masked when they are typing. When user enters text into the field, an eye icon appears at the right side of the field that allows the user to see the text they are entering. Field

				validation tests if the content of the field is identical to the input of Component M (Password).
O	Create Your BBL Account	Button		Triggers creation of a BBL account and redirect user to the New User Dashboard.
P	Cancel	Text Link		Clears all inputs of the Create BBL Account form and redirects user back to screen 1. User account is NOT created.

3. New User Dashboard

One advantage to being a registered users is the ability to a login and view previously entered reports from a dashboard view.

A	Report a New Bird Encounter	Button		Navigates user to step one of the encounter form.
B	Edit My Account Information	Button		Navigates user to an account page that allows user to edit their account information,
C	Language Switcher	Button Group		When the user clicks a language button the language of the dashboard, user account section, and encounter form is

			instantly changed to the language that the user has selected. The language remains selected as part of the user's account information until the user changes their selection. The default language is English.

Encounter Form

4. Encounter Form Step One: Date and Marker Type

In order to help navigate the user through the form flow, bird marking information is asked up-front. As the user moves forward through the form, they will be presented only with the information that is relevant to them. An in-context Encounter Summary (screen 9a) will allow users to see which markings they've selected and easily edit their choices at any point in the form.

A	Date of encounter (approximate)	Date input group	Required	The date input group consists of the following fields: • Day text input - accepts only a two digit numerical input for day of the month • Month dropdown - options for each month of the year • Year text input - accepts only a four digit input for the year

B	Hunting season	Checkbox	Optional	
C	Select all markings that appear on the bird	Checkbox group	One selection is required	Options for checkboxes: ● Band ● Reward Band ● Color Marker ● Dye on bird ● Electronic device Selections of these checkboxes show or hide later corresponding steps of the encounter form.
D	Continue to Location Information			
E	Go Back			

5. Encounter Form Step Two: Location of Encounter

Increased encounter reporting provides useful information in understanding movement and migratory patterns, survival rates, and the effects of environmental conditions and management actions. It's important, therefore, to have accurate location information regarding bird encounters. By utilizing the Google Maps API, user's are given immediate feedback on their location input. The user is able to enter the name of a common place and the map's API generates an exact latitude and longitude that the user can further manipulate by dragging the resulting marker to the desired point. Additionally, users have the option of using their current geolocation or manually entering an address, point of reference, or longitude and latitude that will then be entered into the encounter record.
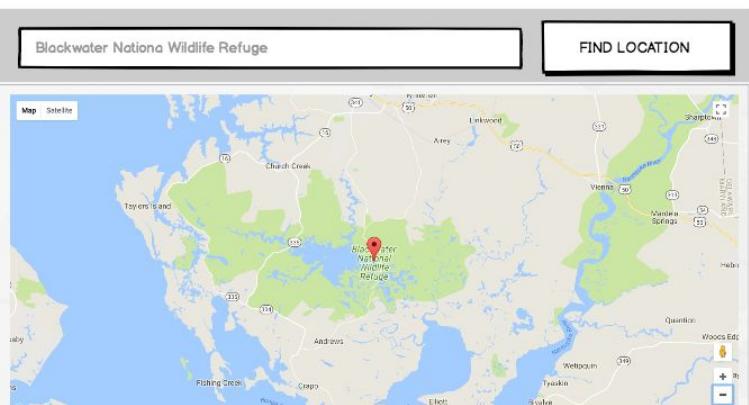
Note: all pages of the form are dynamic based on the selections made on Screen 4, Component C, however Step 2 (Location of Encounter) is required and always shown to the user.

A	Use My Current Location	Button		This button will generate the current location of the device using location services to provide the latitude and longitude that will be submitted as the

12				location of the encounter. This will be especially useful for users who are reporting a band on a mobile device while hunting or birding in a rural environment
B	Address Input	Text input powered by Google location API	Required if component A is not selected	When the user begins typing a location in the box, the Google Maps API will populate suggested locations in the dropdown based on the input. When the user selects a location, the map will zoom to the place selection and the latitude and longitude are provided to the backend of the form via the the API. An example of the API / map integration can be seen at: https://developers.google.com/maps/documentation/javascript/examples/places-searchbox.
C	Continue to Band and Bird Information	Button		Submits the location information and navigates the user to the next applicable step of the form
D	Go Back	Text Link		Returns user to Encounter Date and Marker Type screen of the form (screen 4)

6. Encounter Form Step Three: Band and Bird Information
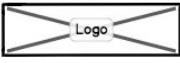
A	Status of Band	Select Box	Required	See metadata type 13.3.3 for select options.
B	Band Number	Double text input	Required	The bird band prefix and suffix are collected in two different text inputs to ensure that the band numbers are properly formatted for each banding encounter.
C	Reward Number	Text input	Required if visible	Field is only visible if "Reward Band" is selected in screen 4, component C
D	How was the bird / band obtained?	Select box group	Required. If additional select boxes are generated by answer chosen, they are also	If the user chooses certain options in the select box, an additional select box is generated to gather additional details about how the bird was obtained. See metadata type 13.3.3 for select options and options for follow up questions.

				required.
E	Status of the bird	Select box	Required	See metadata type 13.3.3 for select options.
F	Species	Autocomplete	Required	When the user starts typing into the input, the autocomplete matches the text and provided all of the inputs into a dropdown. When the user selects an option, it is populated into the input.
G	I don't know the species of the bird	Text Link		Triggers the Species Identification Flow popup (screen 6a)
H	Continue to marker information	Button		Submits the band and bird information and navigates the user to the next applicable step of the form (based on answers selected in in screen 4, component C)
I	Go Back	Text Link		Returns user to the Location of Encounter Screen (screen 5)

6a. Species Identification Flow Step One: Birds by Type

In the species identification flow, users are guided through screens that help them to identify the bird they encountered. In step one of the flow, users can select a bird type and are provided with a narrowed down list of bird species.

A	Select a Type of Bird	Select Box	Required	See metadata type 5.0.0 for select options.

B	Browse a List of Bird Species	Select Box	Required	See metadata type 6.0.0 for select options.
C	Select Species	Button		Closes the Species Identification Flow and populates the species name into screen 6, component F
D	I can't identify the species	Text Link		Navigates the user to Step Two in the Species Identification Flow

6b. Species Identification Flow Step Two: Enter Bird Details

In the event that a novice user does not know the type and species of bird, they are presented with further information to help narrow down the species they encountered. Combining this data with the already reported location data allows the interface to bring back the most likely combination of species. The more data the user is able to provide on this screen, the narrower the resulting list will be (screen 6c).

A	Bird Sex	Radio group	Required	See metadata type 13.5.5 for select options.
B	Bird Size	Radio group	Required	See metadata type 9.7.0 for select options.

C	Primary Color	Select box	Required	See [metadata type 12.5.0](#) for select options.
D	Beak Shape	Select box	Optional	See [metadata type 12.3.0](#) for select options.
E	Secondary Color	Select box	Optional	See [metadata type 12.5.0](#) for select options.
F	Habitat	Select box	Optional	See [metadata type 11.3.0](#) for select options.
G	Sound	Select box	Optional	See [metadata type 12.4.0](#) for select options.
H	Feeding behavior	Select box	Optional	See [metadata type 12.2.0](#) for select options.
I	Find Species	Button		Submits Species Identification form and navigates user to Species Identification Flow step three ([screen 6c](#))
J	I don't have any details about the bird	Text link		Closes the Species Identification flow and populates "Unknown" into the species input at [screen 6](#), component F.

6c. Species Identification Flow Step Three: Select Bird That You Encountered
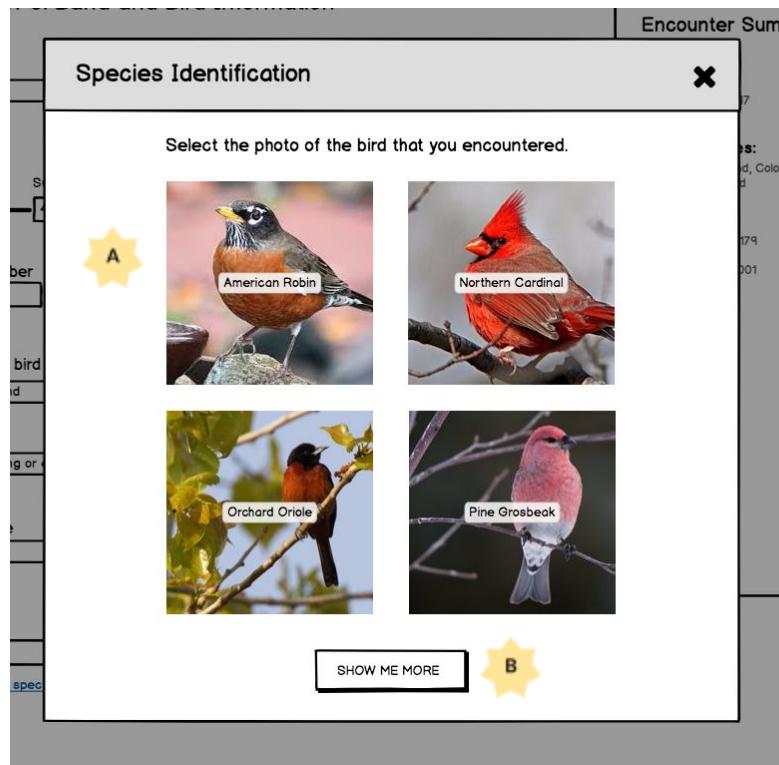
A	Species name and image	Linked image and text		See metadata type 6.0.0 and 8.0.0 for image and common name information
B	Show Me More	Button		Advances user through additional screens of bird images, if they are available.

6d. Species Identification Flow Step Three: Can't Identify Bird
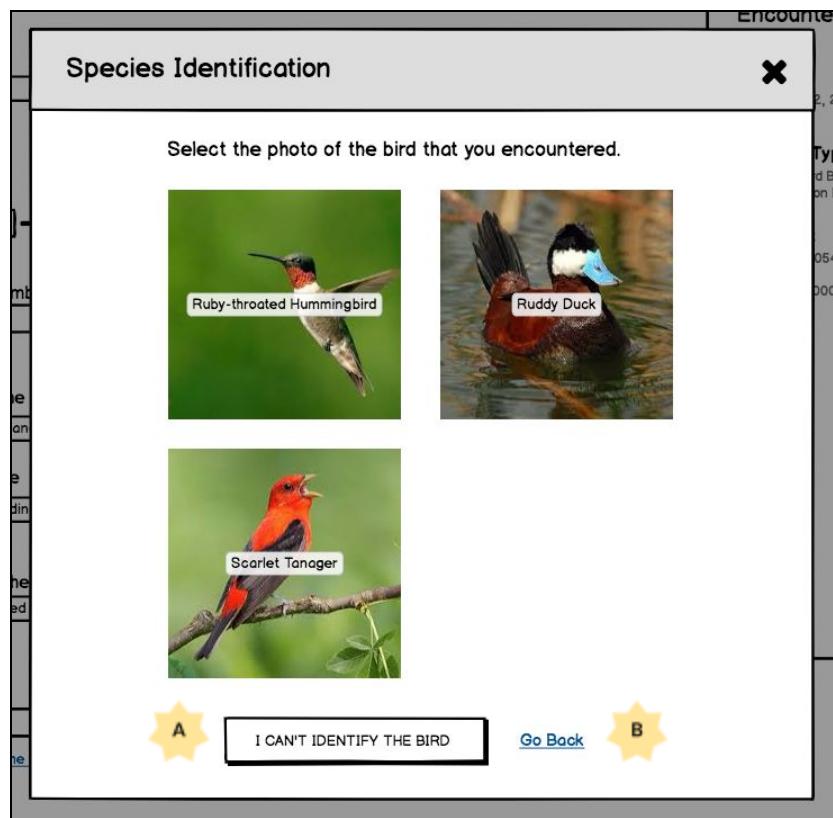
Note: The user will be presented with up to twelve different options of birds based on the details they provided on screen 6b. The images will be presented four to a screen. On the last available screen, if they haven't been able to identify the bird from their encounter, they will be given the option to exit the Species Identification flow which will populate "Unknown" into screen 6, component F.

A	I can't identify the bird	Button		This button only appears on the final screen of the Species Identification flow. Closes the modal and populates "Unknown" into Screen 6, Component F.
B	Go Back	Text link		Take the user to the previous modal screen

6e. Species Identification Flow Step Three: Select Bird
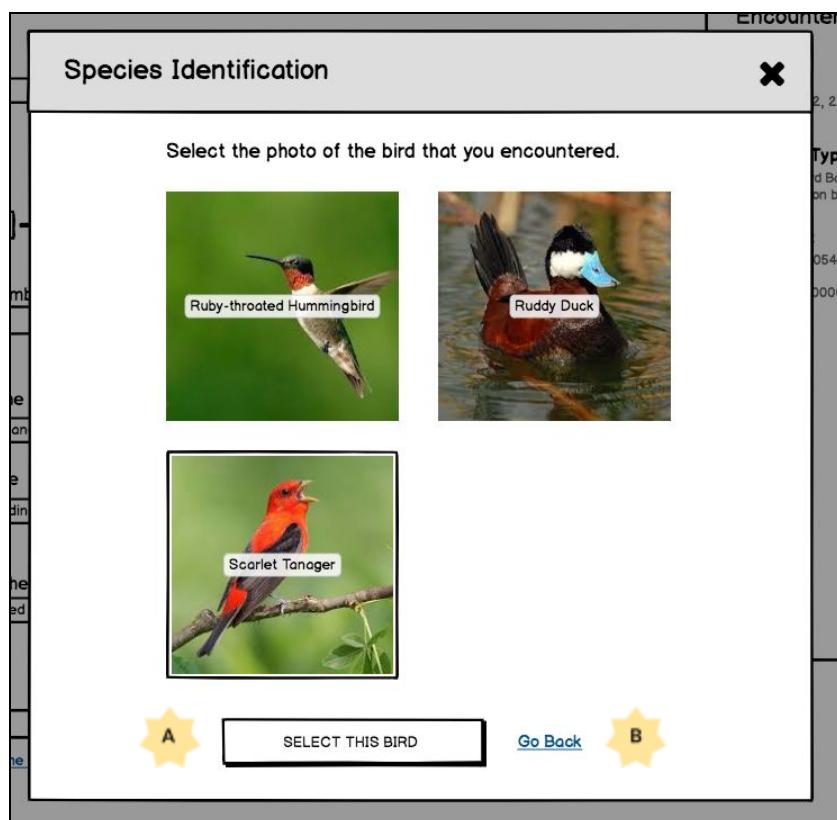
A	Select this bird	Button		When the user has selected an image, the primary button on the modal changes to "Select This Bird," which closes the Species Identification flow and populates the selected species into into [screen 6](), Component F.
B	Go back	Text link		Takes the user to the previous modal screen

7. Encounter Form Step Four: Marker Information

Note: This page will only appear to the users who have selected the "Color Marker" checkbox for screen 4, component C. All other users will advance to the next applicable screen.

A	Area Selection	Button	Required	Each area of the bird which may have a marker has a button in the visual interface, when the button is selected, the appropriate form input fields are generated. The user must select at least one marker if this page is visible.
B	Color of Marker	Select Box	Required	See metadata type 13.4.2 for select

				options.
C	Explain	Text input	Required if visible	
D	Code Present	Checkbox	Optional	If checkbox is selected, Code Number (component E) and Color of Code (component F) are generated.
E	Code Number	Text input	Required if visible	
F	Color of Code	Select Box	Required if visible	See metadata type 13.4.2 for select options.
G	Continue to Dye Information	Button		Navigates user to Dye Area (screen 8) or next applicable screen. Text will be dynamic based on options selected in screen 4, component C
H	Go Back	Text input		Navigates user back to last applicable screen

8. Encounter Form Step Five: Dye Areas

Note: This page will only appear to the users who have selected the "Dye on Bird" checkbox for <u>*screen 4*</u>*, component C. All other users will advance to the next applicable screen.*

A	Area Selection	Button		Each area of the bird which may be marked with dye has a button in the visual interface. When the button is selected, the appropriate form input fields are generated. The user must select at least one marker if this page is visible.
B	Color dropdown	Select box		See <u>metadata type 13.4.2</u> for select options.
C	Continue to Review	Button		Navigates user to Review Screen (<u>screen 10</u>) or next applicable screen. Text will be dynamic based on the user's logged state.
D	Go Back	Text link		Navigates user back to last applicable screen

9. Encounter Form: Contact Information

Note: This page will only appear to the users who have not created an account or logged in. Users with an account will have the opportunity to edit their contact information on the review screen.

A	First Name	Text input	Required	
B	Last Name	Text input	Required	
C	Email address	Text input	Required	Validate for proper email formatting
D	Daytime phone	Text input with pre-formatted area code and dash	Optional	As the user types into the field, the area code parentheses and dash are pre-populated.
E	Please select all of the options that apply to you	Checkbox group	One selection is required	Options for checkboxes: • I am the finder or am reporting on behalf of the finder.

				• I am a bird bander or a bander's assistant. • I am Federal, State, or Provincial official.
F	Permit number	Text input	Optional as international permits are not accepted.	Visible if "I am a bird bander or a bander's assistant." is selected for component F on screen 2.
G	Street Address	Text input	Optional	Text input utilizes the Google Maps API, when the user begins typing their address, they are presented with address options in a typeahead. When an address is selected from the dropdown, the entire address form is populated. An example of this api can be found at: https://developers.google.com/maps/documentation/javascript/examples/places-autocomplete-addressform
H	Address Line Two	Text Input	Optional	Will be populated by Google Maps API. Resulting address can be overwritten.
I	City	Text Input	Optional	Will be populated by Google Maps API. Resulting address can be overwritten.
J	State	Text Input	Optional	Will be populated by Google Maps API. Resulting address can be overwritten.
K	Zip / Postal	Text Input	Optional	Will be populated by Google Maps API. Resulting address can be overwritten.
L	Create a BBL Account	Checkbox	Optional	
M	Password	Password Input	Required if visible	User input is masked when they are typing. When user enters text into the field, an eye icon appears at the right side of the field that allows the user to see the text they are entering. As user types into the fields, a popover appears below the input that informs the user of the password requirements. As the requirements are met, each line of the popover will have a visual feedback that informs the user that they have met that criteria (for example, a red "X" changes to a green check).
O	Confirm Password	Password Input	Required if visible	User input is masked when they are typing. When user enters text into the field, an eye icon appears at the right side of the field that allows the user to see the text they are entering. Field validation tests if the content of the field is identical to the input of component M (Password).
P	Continue to Review	Button		Navigates user to Review Screen (screen 10)
Q	Go Back	Text Link		Navigates user back to last applicable

				screen

10. Encounter Form: Review Your Information

A	Edit Date of Encounter	Text Link		Navigates user to Date of Encounter form ([screen 4](#))
B	Edit Marking Types	Text Link		Navigates user to Marking Type form

				(screen 4)
C	Edit Location	Text Link		Navigates user to Location form (screen 5)
D	Edit Band and Bird Information	Text Link		Navigates user to Band and Bird Form (screen 6)
E	Edit Color Marker Information	Text Link		Navigates user to Color Marker Form (screen 7)
F	Edit Dye Information	Text Link		Navigates user to Dye Information form (screen 8)
G	Edit Contact Information	Text Link		Navigates user to Contact Information form (screen 9)
H	Would you like to receive a certificate of the banding data via email?	Radio group		
I	Comments about your encounter	Text area		
J	Add photographs to your encounter	File upload		
K	Submit Encounter Report	Button		Submits encounter report and navigates user to the Thank You page (screen 10)
L	Cancel	Text link		Triggers an alert that tells user they are about to lose all progress if they proceed with cancel. Gives user second option to revert or proceed with cancel.

9a. In-context Summary

Encounter Summary:

Date of   edit   **A**
November 22, 2017

Marking Types: edit   **B**
Band, Reward Band, Color
Marker, Dye on bird

Location: edit   **C**
Latitude: 39.0543179
Longitude:
-76.81700710000001

Band & Bird   edit   **D**
Information:
Status: Left on bird
Band Number: 123-4567
Reward Number: 12345
How Obtained: Cought by hand -
Found in building or enclosure
Status of the Bird: Alive released
Species: Scarlet Tanager

Color Marker   edit   **E**
Information:
Nasal saddle present
Color: Other - Band was red and
green
Code: 1234
Code Color: White
Leg Band present
Left leg
Code: 4567
Color: Yellow

A	Edit Date of Encounter	Text link		Navigates user to Date of Encounter Form (screen 4)
B	Edit Marking Types	Text link		Navigates user to Marking Type Form (screen 4)
C	Edit Location	Text link		Navigates user to Location Form (screen 5)
D	Edit Band and Bird Information	Text link		Navigates user to Band and Bird Form (screen 6)
E	Edit Color Marker Information	Text link		Navigates user to Color Marker Form (screen 7)

10. Thank You
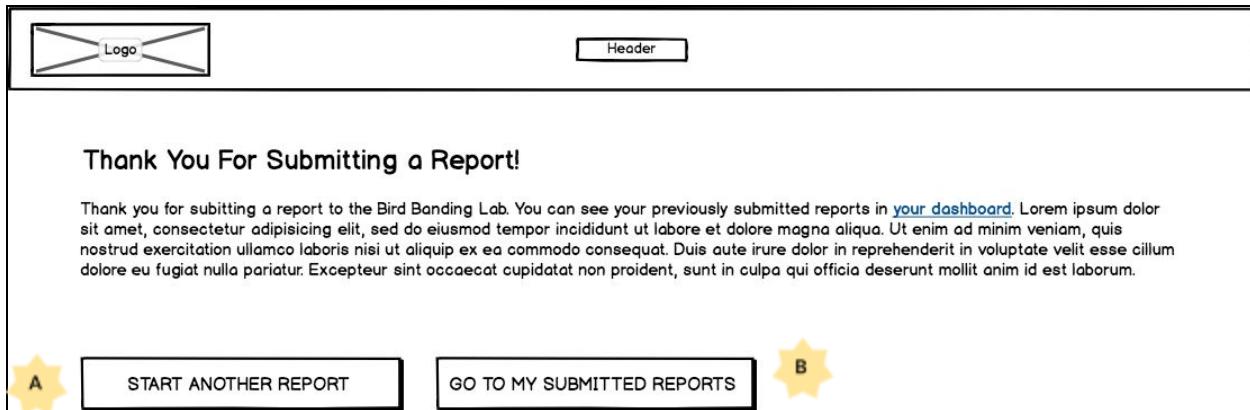
Note: Only logged in users are given the option to Go To My Submitted Reports. Guest users are only able to Start Another Report.

A	Start Another Report	Button		Navigates the user to the first step of the encounter form (screen 4)
B	Go To My Submitted Report	Button		Navigates logged in user to their dashboard

11. Populated User Dashboard

A	Report a New Bird Encounter	Button		Navigates the user to the first step of the encounter form (screen 4)
B	Edit My Account	Button		Navigates user to the Edit Account information screen
C	Edit Submitted Report	Text Link		Allows user to edit submitted report data before it is processed by the BBL
D	View Submitted Report	Text Link		Allows user to view submitted report data

Summaries of Banding and Encounter Data

Customized summary reports of bird banding and past encounter records can be quickly and easily created. By identifying specific data types--derived from the metadata and taxonomy--users can tailor the report's contents to their specifications. The proposed design allows for user to access data immediately upon request since it is dynamic and automatic.

Data Requests and Search

Search Interface

A	Band Number	Double Text Input	Optional & Exclusive	The bird band prefix and suffix are collected in two different text inputs to ensure that the band numbers are properly formatted. Entering a bird band disables the remaining search facets.
B	Country	Select Box	Required	See [metadata type 13.6.1](#) for select

				options.
C	State / Region	Select Box	Required	See metadata type 13.6.3 for select options. States/Regions should filter according to Country selected. If State/Region is not applicable to the selected Country, this field may remain blank.
D	Type of Bird	Select Box	Optional	See metadata type 4.0.0 for select options.
E	Species of Bird	Text Input	Optional	The common name of the species in the lowest taxonomic rank that can be determined as known by popular nomenclature. Text input will feature typeahead capabilities to assist users.
F	Date Range	Slider / Text input	Optional	Date range will default to all available data (1960-present). Users may adjust according to their needs.
G	Search Banding Data	Button		Triggers the search query and brings back applicable results.

Search Results: Band Number

Users may choose to search by an individual band number at which point all other filters are disabled.

A	**List View**	Map View	Button group		Toggles search results between a list (table) view and an interactive map view (see next page for wireframe).
B	Date Range	Slider / Text		Date range will default to all available

		input		data (1960-present). Users may adjust according to their needs.
C	Customize and Export Data	Button		
D	Start new search	Text link		Returns user to the initial Search screen.

Search Results: Band Number (Map View)

In Map View, users can select the interactive data points for more information.
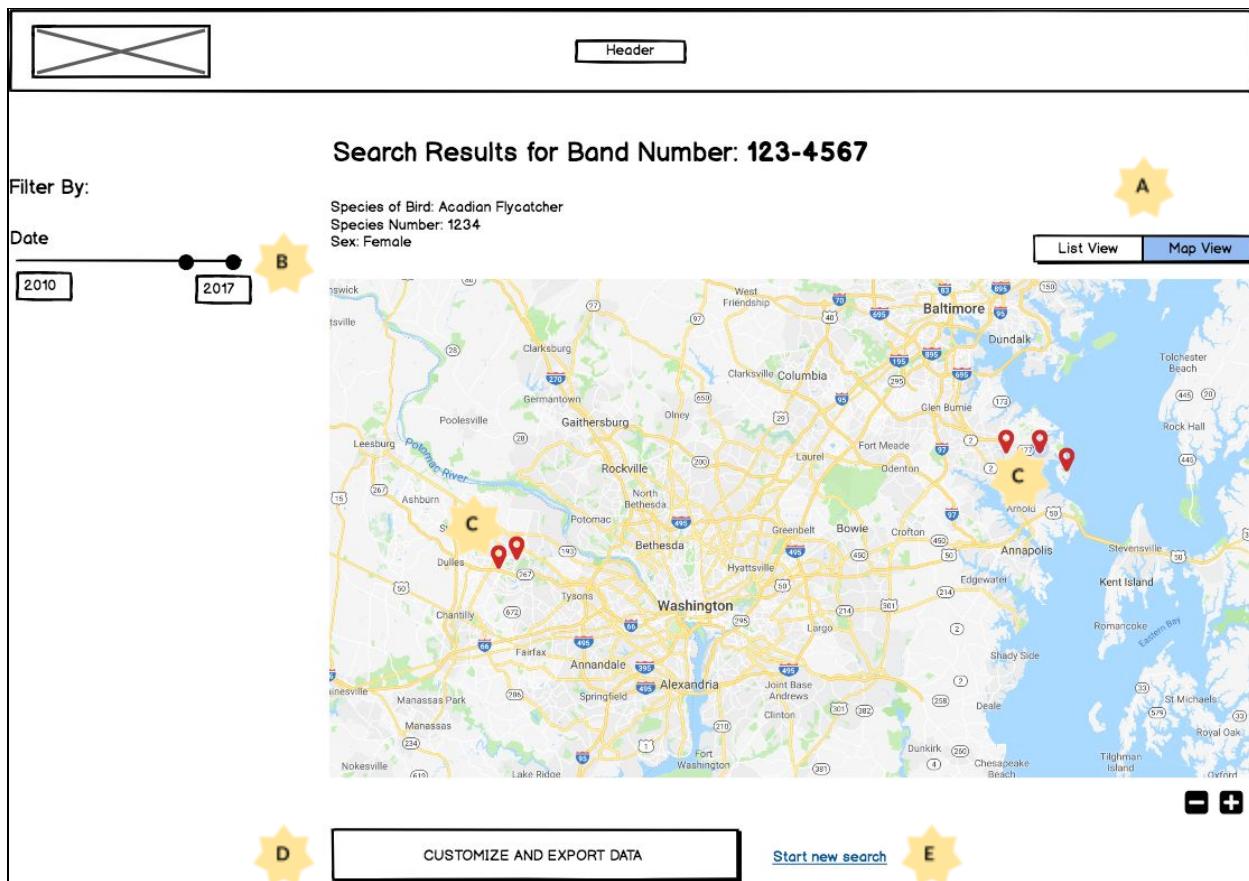
A	List View | **Map View**	Button group		
B	Date Range	Slider / Text input		Date range will default to all available data (1960-present). Users may adjust according to their needs.
C	Interactive Data Point(s)	Click / Hover		
D	Customize and Export Data	Button		
E	Start new search	Text link		Returns user to the initial Search screen.

Search Results: General

User's are able to further narrow the results by a specific county, type or species of bird (if not already selected), and by the date both banding and encounter reports were recorded. For specific information on banding or encounter records, users are able to click the corresponding numbers to drill down into the search results.

A	County	Select Box		Select options will include counties specific to the state/region selected by the user in the initial search query.
B	Type of Bird	Select Box		See metadata type 4.0.0 for select options.
C	Species of Bird	Text input		The common name of the species in the lowest taxonomic rank that can be determined as known by popular nomenclature. Text input will feature typeahead capabilities to assist users.
D	Date Range	Slider / Text input		Date range will default to all available data (1960-present) unless a specific date

				range was selected in the initial query. Users may adjust according to their needs.
E	Bandings Count	Text link		Takes the user to results specific to the initial banding event.
F	Encounters Count	Text link		Takes the user to results specific to other encounter events.
G	Customize and Export Data	Button		
H	Start new search	Text link		Returns user to the initial Search screen.

Search Results: General → Encounter

A	County	Select Box		Select options will include counties specific to the state/region selected by the user in the initial search query.
B	Bird Status	Select Box		See metadata type 14.3.0 for select options.
C	How Obtained	Select Box		See metadata type 14.2.3 for select options.
D	Flyway	Select Box		See metadata type 13.6.2 for select options.
E	Aux marker present	Checkbox		If checked, filters by birds who have other types of auxiliary markers.
F	Reward band present	Checkbox		If checked, filters by birds who have reward bands present.
G	Sex	Checkbox		See metadata type 13.5.5 for select options.
H	Encounter Date	Slider / Text input		Date range will default to all available data (1960-present) unless a specific date range was selected in the initial query or on the previous screen. Users may adjust according to their needs.

I	Back to result list	Text link		Returns the user to the Search Results.
J	List View | Map View	Toggle Button		
K	Customize and Export Data	Button		
L	Start new search	Text link		Returns user to the initial Search screen.

Search Results: General → Encounter (Map View)

A	County	Select Box		Select options will include counties specific to the state/region selected by the user in the initial search query.
B	Bird Status	Select Box		See metadata type 14.3.0 for select options.
C	How Obtained	Select Box		See metadata type 14.2.3 for select options.
D	Flyway	Select Box		See metadata type 13.6.2 for select options.
E	Aux marker present	Checkbox		If checked, filters by birds who have other types of auxiliary markers.

F	Reward band present	Checkbox		If checked, filters by birds who have reward bands present.
G	Sex	Checkbox		See metadata type 13.5.5 for select options.
H	Encounter Date	Slider / Text input		Date range will default to all available data (1960-present) unless a specific date range was selected in the initial query or on the previous screen. Users may adjust according to their needs.
I	Back to result list	Text link		Returns the user to the Search Results.
J	List View | Map View	Toggle Button		
K	Interactive Data Point(s)	Click / Hover		
L	Customize and Export Data	Button		
M	Start new search	Text link		Returns user to the initial Search screen.

Search Results: General → Banding

A	County	Select Box		Select options will include counties specific to the state/region selected by the user in the initial search query.
B	Bird Status	Select Box		See metadata type 14.3.0 for select options.
C	Age	Select Box		See metadata type 13.5.4 for select options.
D	Sex	Checkbox		See metadata type 13.5.5 for select

				options.
E	Banding Date Range	Slider / Text input		Date range will default to all available data (1960-present) unless a specific date range was selected in the initial query or on the previous screen. Users may adjust according to their needs.
F	Back to result list	Text link		Returns the user to the Search Results.
G	List View | Map View	Button group		
H	Band Number	Text input		
I	Customize and Export Data	Button		
J	Start new search	Text link		Returns user to the initial Search screen.

Customize and Export Data

Banding and encounter data must be readily available for research purposes. To make data easy to access, retrieve, and summarize users need to presented with an enriched and robust experience that allows them to customize data for their needs when they need it.

A	Select fields for custom report	Checkboxes		Default to common fields but allow the user to further customize the report with the information that is most relevant to them.
B	Present data as ● Numerical Codes ● Human-readable Text	Radio Buttons		Not all users are scientists, and even some scientists may appreciate readily translated codes and values into plain text.
C	Download Data as CSV			
D	Download Data as Excel File			
E	Cancel			Returns user to the previous screen.

Appendix

Content must be agile and flexible in order to create personalized and curated content. To get to a point where information is fully exploited and working to meet the needs of an organization, time and effort must be spent building the appropriate foundation for the information ecosystem. Defining a taxonomy and metadata to help support an organization's goals for making content adaptable, customizable and easy to distribute is an important step in this process. While taxonomies and metadata share many attributes and are both designed to improve search and discovery, they are different from one another primarily in that a taxonomy helps to define keywords and organize content into hierarchical relationships while metadata describes each asset. Taxonomy and metadata are both needed to help content perform. Continuous management of both the taxonomy and metadata is important in building a solid foundation that enhances findability, allows for the configuration of content in any number of ways and ultimately provides a good user experience.

Taxonomy Architecture

A taxonomy can be thought of as an asset catalogue. It provides a useful way to define similarities and hierarchical relationships using a set of descriptive terms and labels, often referred to as a controlled vocabulary. A taxonomy labels structured and unstructured content so that it can be rearranged, reused, organized, searched, and distributed in any number of ways. This improves the ability to organize collections of connected, or related content, making it easier for users to search or browse. Without a defined taxonomy, content becomes difficult to adapt and reuse.

Taxonomies should be designed with the end user in mind. What categories would users want to access? How might they search for information relevant to their needs? It is important to control the number of collections within a taxonomy so that information is quick and easy to find, is intuitive, and has a logical flow so that users can narrow their search easily.

The scientific community and bird banders would use the bird identification and search interface to track information on an individual bird or species as well as create custom bird reports. By selecting specific data attributes, they would narrow the results set to their areas of interest. Starting with the scientific order, family, and species names, they could query all birds meeting certain specifications for length, wingspan, and/or weight. To further customize data output, facets--such as region/state, flyway boundaries, habitat, nesting, feeding behavior, color, bill shape, band size, and sound--could be included in the search.

Casual bird watchers, hunters, and general bird finders could use the bird identification and search interface to access information on birds in their area and to track information on an individual bird. Starting with the common order, family, and species names, they could narrow the search results by selecting any additional attributes, such as the facets, or length, wingspan, or weight.

Taxonomy Example

See taxonomy example on page 62.

Data Elements

	Label	Description / Usage	Required
1	Common Order	Broader Term (BT1). See metadata type 4.0.0 for facets/controlled vocabulary.	Yes
2	Scientific Order	Non-Preferred Broader Term (BT1a)	Yes
3	Common Family	Broader Term (BT2). See metadata type 5.0.0 for facets/controlled vocabulary.	Yes
4	Scientific Family	Non-Preferred Broader Term (BT2b)	Yes
5	Common Name	Preferred Term (PT)	Yes
6	Scientific Name	Non-Preferred Term (NPT1)	Yes
7	Previous Names	Non-Preferred Term (NPT2)	No
8	Length	Inches (in) from tip of bill to tip of tail.	Yes
9	Wingspan	Inches (in); distance from one wingtip to other wingtip while outstretched (fully extended).	Yes
10	Weight	Pounds (lbs)	Yes
11	Similar Birds	Other birds in family.	No
12	Flyway Boundaries	Migratory flight paths. See metadata type 13.6.2 for facets/controlled vocabulary.	No
13	Region / State	Region, state, or province within a country. See metadata type 13.6.3 for facets/controlled vocabulary.	Yes
14	Habitat	Type of shelter/living environment; landscape, landforms. See metadata type 11.3.0 for facets/controlled vocabulary.	Yes
15	Nesting	Types of areas in which bird builds nests. See metadata type 12.1.0 for facets/controlled vocabulary.	Yes
16	Feeding Behavior	Predominant type of behavior exhibited while eating. See metadata type 12.2.0 for facets/controlled vocabulary.	Yes
17	Male Primary Color	Most predominant color on a male bird. See metadata type 12.5.0 for	Yes

		facets/controlled vocabulary.	
18	Male Secondary Color	Second most predominant color on a male bird. See metadata type 12.5.0 for facets/controlled vocabulary.	Yes
19	Female Primary Color	Most predominant color on a female bird. See metadata type 12.5.0 for facets/controlled vocabulary.	Yes
20	Female Secondary Color	Second most predominant color on a female bird. See metadata type 12.5.0 for facets/controlled vocabulary.	Yes
21	Bill Shape	Provides insight into shape adaptation for how they obtain their food, diet type, nest building, preening, and defense / survival. See metadata type 12.3.0 for facets/controlled vocabulary.	Yes
22	Male Band Size	Size of band as determined by BBL. See metadata type 13.3.2 for facets/controlled vocabulary.	Yes
23	Female Band Size	Size of band as determined by BBL. See metadata type 13.3.2 for facets/controlled vocabulary.	Yes
24	Sound	Most predominant sound (call, song,) from bird type. See metadata type 12.4.0 for facets/controlled vocabulary.	Yes

Metadata

Put simply, metadata is data about data or information about content. Metadata is a set of statements, with each statement consisting of a property or element and its associated value. Any property or value applied to content that gives structure, context and meaning is considered metadata. The advantage of metadata is to improve findability by providing organization and access, delivering the right content at the right time to the right user.

Metadata is created in two ways. The first type of metadata is structural and includes elements like date, format, unique identifiers, and relationships inherited by content type. Structural metadata allows for detailed levels of content processing. The second type of metadata is descriptive and is usually added by users, such as the individual species, location, and description. Descriptive metadata helps improve discoverability of the content.

Again, it's important to anticipate users' needs. What will they be searching for? What terms would they use? When users perform a basic search the query will pull back the individual term with all the different pieces of metadata associated with it. Allowing users to search using multiple attributes gives users the ability to perform more complex searches and thus return results that are more useful.

Metadata Example

Metadata Types

	Metadata Type	Description / Usage	Data Type	Nullable
1.0.0	**order (scientific_order)**	The full scientific name of the order in which the taxon is classified.	Text	No
2.0.0	**family (scientific_family)**	The full scientific family in which the taxon is classified.	Text	No
3.0.0	**species (scientific_name)**	The full scientific name in the lowest level taxonomic rank that can be determined.	Text	No
4.0.0	**common_order**	The common order as determined by popular nomenclature. This list is meant to help those users unfamiliar with scientific naming. Consider using a predefined list for uniform naming.	Faceted List (suggested): • Bird of Prey • Marsh Bird • Near-passerine • Nightbird • Passerine • Seabird • Waterfowl	No
5.0.0	**common_family**	The common family as determined by popular nomenclature. This list is meant to help those users unfamiliar with scientific naming. Consider using a predefined list for uniform naming.	Faceted List (suggested - to name a few): • Albatross • Anhinga • Avocet • Barn Owl • Booby • Bunting • Bushtit • Coot • Cormorant • Crane • Creeper • Crow • Cuckoo • Dipper • Dove • Duck • Eagle • Falcon • Finch • Flycatcher • Frigatebird • Gannet • Gnatcatcher • Goose • Grebe • Grosbeak • Gull • Hawk • Heron • Hummingbird • Ibis • Jay	No

			● Kingfisher ● Kinglet ● Kite ● Lark ● Limpkin ● Longspur ● Loon ● Mockingbird ● Nightjar ● Nuthatch ● Oriole ● Osprey ● Oystercatcher ● Parrot ● Pelican ● Petrel ● Pigeon ● Plover ● Puffin ● Shrike ● Stilt ● Stork ● Storm Petrel ● Sparrow ● Swallow ● Swan ● Swift ● Thrasher ● Thrush ● Towhee ● Trogon ● Typical Owl ● Verdin ● Vireo ● Vulture ● Warbler ● Waxwing ● Woodpecker ● Wren	
6.0.0	**common_name**	The common name of the species in the lowest taxonomic rank that can be determined as known by popular nomenclature. This list is meant to help those users unfamiliar with scientific naming.	Text	No
7.0.0	**french_name**	The French name in the lowest level taxonomic rank that can be determined.	Text	Yes
8.0.0	**image**	Still-image depicting close-up of individual species to assist with species identification during encounter reporting.	Link to Image File (such as JPG, JPEG, PNG)	Yes
9.0.0	**measurements**	Aggregate data pulled from individual banding records. No manual input required. See metadata type 13.5.0 for specific details.	*(see subset of information for specific details)*	*(see subset of information for specific details)*
9.1.0	➔ min_length_inches	Minimum length (in inches) as	Automatically populated	Yes

			recorded from banding records.	from banding data.	
9.2.0	➜	max_length_inches	Maximum length (in inches) as recorded from banding records.	Automatically populated from banding data.	Yes
9.3.0	➜	min_wingspan_inches	Minimum wingspan (in inches) as recorded from banding records.	Automatically populated from banding data.	Yes
9.4.0	➜	max_wingspan_inches	Maximum wingspan (in inches) as recorded from banding records.	Automatically populated from banding data.	Yes
9.5.0	➜	min_weight_pounds	Minimum weight (in pounds) as recorded from banding records.	Automatically populated from banding data.	Yes
9.6.0	➜	max_weight_pounds	Maximum weight (in pounds) as recorded from banding records.	Automatically populated from banding data.	Yes
9.7.0	➜	bird_size	Species will be categorized into a predetermined size rank as determined by data from banding records.	(suggested): ● Small (<5" in length) ● Medium (5"-9" in length) ● Large (>9" in length)	Yes
10.0.0	**similar_species**		List of related species or non-related species that are similar in appearance.	*(see subset of information for specific details)*	*(see subset of information for specific details)*
10.1.0	➜	species	The full scientific name in the lowest level taxonomic rank that can be determined. No maximum. (Related to metadata type 3.0.0)	Text	Yes
11.0.0	**location**		Includes so aggregate data pulled from individual banding (and encounter) records. See metadata type 13.6.0 and metadata type 14.7.0 for specific details.	*(see subset of information for specific details)*	*(see subset of information for specific details)*
11.1.0	➜	flyway	Listing of all flyways as indicated in individual banding (and encounter) records. No maximum.	Automatically populated from banding (and encounter) data.	Yes
11.2.0	➜	region	Listing of all states and/or regions as indicated in individual banding (and encounter) records. No maximum.	Automatically populated from banding (and encounter) data.	Yes
11.3.0	➜	habitat	A common, one word description of the habitat in which the species is commonly found to assist with species identification during encounter reporting. Maximum of one (1).	Faceted List (suggested): ● Cost / Shoreline ● Desert ● Forest ● Grassland ● Lake / Pond ● Marsh / Swamp ● Mountain ● Ocean ● Open Woodland	Yes

			● River / Stream ● Urban	
12.0.0	**characteristics**	Additional characteristics or assertions about the species. Meant to provide a mechanism for species identification during reporting and to provide a mechanism for structured content.	*(see subset of information for specific details)*	*(see subset of information for specific details)*
12.1.0	➔ nesting	A common, one word description of the nesting area in which the species is commonly found to assist with species identification during encounter reporting. Maximum of one (1).	Faceted List (suggested): ● Building ● Burrow ● Cave ● Cavity ● Cliff ● Floating ● Ground ● Rock ● Shrub ● Tree	Yes
12.2.0	➔ feeding_behavior	A common, one word description of the feeding behavior to assist with species identification during encounter reporting. Maximum of one (1).	Faceted List (suggested): ● Aerial Diver ● Aerial Forager ● Bark Forager ● Dabbler ● Flycatching ● Foliage Gleaner ● Ground Forager ● Hoverer ● Prober ● Soarer ● Stalker ● Surface Diver	Yes
12.3.0	➔ bill_shape	A common, one word description of the feeding behavior to assist with species identification during encounter reporting. Maximum of one (1).	Faceted List (suggested): ● All-purpose ● Cone ● Curved ● Dagger ● Hooked ● Needle ● Spatulate ● Specialized	Yes
12.4.0	➔ sound	A common, one word description of the sound the species makes to assist with species identification during encounter reporting. Maximum of one (1).	Faceted List (suggested): ● Bugle ● Buzz ● Cackle ● Caw ● Chatter ● Chirp ● Cluck ● Coo ● Grunt ● Honk ● Hoot ● Quack ● Rattle ● Screech ● Silent	Yes

				●Squawk ●Trill ●Tweet ●Warble ●Whine ●Whip ●Whistle ●Yelp	
12.5.0	➔	male_primary_color	A common, one word description of the male primary color to assist with species identification during encounter reporting. Maximum of one (1).	Faceted List (suggested): ●Black ●Blue ●Blue-gray ●Blue-green ●Brown	Yes
12.6.0	➔	male_secondary_color	A common, one word description of the male secondary color to assist with species identification during encounter reporting. Maximum of one (1). Should not be the same as the primary color.	●Buff ●Chestnut ●Dark brown ●Dark gray ●Gray ●Gray-brown ●Gray-black	Yes
12.7.0	➔	female_primary_color	A common, one word description of the female primary color to assist with species identification during encounter reporting. Maximum of one (1).	●Green ●Olive ●Orange ●Pink ●Purple ●Red	Yes
12.8.0	➔	female_secondary_color	A common, one word description of the female secondary color to assist with species identification during encounter reporting. Maximum of one (1). Should not be the same as the primary color.	●Rust ●White ●Yellow	Yes
12.9.0	➔	male_band_size	Aggregate listing of all male band sizes as indicated in individual banding records. No maximum.	Automatically populated from banding data.	Yes
12.10.0	➔	female_band_size	Aggregate listing of all female band sizes as indicated in individual banding records. No maximum.	Automatically populated from banding data.	Yes
13.0.0	**band_record**		Information about the initial banding of an individual bird.		*(see subset of information for specific details)*
13.1.0	➔	band_date	Full date of bird banding. (MM-DD-YYYY)	Date	No
13.2.0	➔	bander_permit	Permit number of bander.	Numeric	No
13.3.0	➔	banding_data	Information pertaining to the band itself.		*(see subset of information for specific details)*
13.3.1		*band_type*	Band material and style. Style should be filtered based on	Faceted List (suggested): ●Unknown	No

| | | material selected. | ○ Unknown ● Aluminum ○ Butt-end toll free ○ Lock-on toll free ○ Tall toll free ○ Butt-end new address ○ Lock-on new address ○ Rivet toll free ○ Short toll free ○ Pre-open toll free ○ Short new address ○ Rivet new address ○ Butt-end ○ Lock-on ○ Tall ○ Wrap around ○ Flipper ○ Rivet ○ Short ○ Pre-open ○ Tall new address ○ Pre-open new address ○ Butt-end web address ○ Lock-on web address ○ Rivet web address ○ Short web address ○ Butt-end Bowie address ● Monel ○ Butt-end ○ Lock-on ○ Butt-end toll free ○ Pre-open ○ Pre-open toll free ● Titanium ○ Butt-end ● Incoloy or Stainless ○ New address ○ Butt-end new address ○ But-end ○ Lock-on ○ Butt-end toll free ○ Lock-on toll free ○ Flipper ○ Rivet ○ Rivet toll free ○ Triangular toll free ○ Triangular ○ Triangular new address ○ Web address ● Bimetallic ○ No address ○ Butt-end ○ Lock-on ○ Tall ○ Rivet ○ Short | |

			○ Pre-open ○ Butt-end toll free ○ Lock-on toll free ○ Tall toll free ○ Short toll free ○ Pre-open toll free ● Stainless Steel 　○ Web address 　○ Butt-end web address ● Incoloy 　○ Web address ● Misc. 　○ Butt-end ● Frigate/Parrot ● Aluminum Plasticine ● Banding Mortality ● No Band ● Flat Locking Tab 　○ Web address ● Plastic Glue	
13.3.2	*band_size*	Size code of the band as determined by the internal diameter and height of band.	Faceted List (suggested): ● X ● 0A ● 0 ● 1 ● 1A ● 1B ● 1C ● 1D ● 1P ● 2 ● 2A ● 3 ● 3A ● 3B ● 4 ● 4A ● 4V ● 5 ● 5A ● 5R ● 6 ● 6M ● 7 ● 7A ● 7B ● 7D ● 7V ● 8 ● 8A ● 9 ● 9A ● 9C ● 9V ● EX ● UK ● N	No
13.3.3	*band_status*	Describes the condition of the band at the time of banding.	Faceted List (suggested): ● Original Band	No

			● Replacement Band ● Additional Band ● Bands identified as multiple when encounter was loaded ● Band Lost ● Record Lost ● Double Banded 2nd ● Band Destroyed ● Schedule in File ● Manding Mortality	
13.3.4	*reward_number*	Reward band number (if present).	Numeric	Yes
13.4.0	➔ marking_data	Auxiliary, tracking device, and dye information (if present).	*(see subset of information for specific details)*	*(see subset of information for specific details)*

13.4.1	*aux_type*	Auxiliary marker types including Federal Metal Bands.	Faceted List (suggested):
			● Federal Metal Band
			  ○ Anodized
			  ○ Painted
			  ○ Taped Over
			● Color Leg Band
			  ○ Plastic
			  ○ Anodized
			  ○ Painted Alum.
			  ○ Taped Over Alum.
			● Neck Collar
			● Reward Band
			● Misc. Metal Band (Foreign, State, Prov., etc.)
			● Dye/Paint
			  ○ Breast
			  ○ Tail
			  ○ Wing
			  ○ Head/Neck
			  ○ Multiple
			● Temporary Marker
			  ○ Tail Streamer
			  ○ Imped Feather
			  ○ Glued
			  ○ Misc.
			● Tag
			  ○ Wing
			  ○ Back
			  ○ Head
			  ○ Nasal Saddle
			  ○ Disk Nasal Marker
			  ○ Web/Toe
			  ○ Leg Flag
			● PIT Tag
			  ○ Tail Mount
			  ○ Backpack
			  ○ Leg Attachment
			  ○ Surgical Implant
			  ○ Subcutaneous
			  ○ Neck Attachment
			  ○ Other
			  ○ Leg-loop Harness
				No

			○ Glued to Skin/Feathers
			○ Prong and Suture
			● Satellite/Cell/GPS Transmitter
			  ○ Tail Mount
			  ○ Backpack
			  ○ Leg Attachment
			  ○ Surgical Implant
			  ○ Subcutaneous
			  ○ Neck Attachment
			  ○ Other
			  ○ Leg-Loop Harness
			  ○ Glued to Skin/Feathers
			  ○ Prong and Suture
			● Radio Transmitter
			  ○ Tail Mount
			  ○ Backpack
			  ○ Leg Attachment
			  ○ Surgical Implant
			  ○ Subcutaneous
			  ○ Neck Attachment
			  ○ Other
			  ○ Leg-loop Harness
			  ○ Glued to Skin/Feathers
			  ○ Prong and Suture
			● Data Logger/Geolocator
			  ○ Tail Mount
			  ○ Backpack
			  ○ Leg Attachment
			  ○ Surgical Implant
			  ○ Subcutaneous
			  ○ Neck Attachment
			  ○ Other
			  ○ Leg-loop Harness
			  ○ Glued to Skin/Feathers
			  ○ Prong and Suture
			● Misc.	

13.4.2		*aux_color*	Auxiliary colors. Colors should filter based on auxiliary type selected.	Faceted List (suggested): ● Red ● Yellow ● Blue ● Green ● White ● Black ● Orange ● Gray ● Purple ● Lavender ● Gold ● Brown ● Silver ● Pink ● Magenta ● Mauve ● Misc. ● Light Blue	Yes

		• Dark Blue • Light Green • Dark Green • Light Pink • Hot Pink • Maroon • Aqua • Azure • Burgundy • Chartreuse • Flesh • Lime • Ochre • Olive • Tan • Turquoise • Multi-color • Red/Cream • Red/Yellow • Red/Blue • Red/Green • Red/White • Red/Black • Red/Orange • Red/Mauve • Red/Light Blue • Red/Dark Blue • Red/Light Green • Red/Dark Green • Red/Light Pink • Red/Turquoise • Yellow/Red • Yellow/Blue • Yellow/Green • Yellow/White • Yellow/Black • Yellow/Orange • Yellow/Mauve • Yellow/Light Blue • Yellow/Dark Blue • Yellow/Light Green • Yellow/Dark Green • Yellow/Light Pink • Blue/Red • Blue/Yellow • Blue/Green • Blue/White • Blue/Black • Blue/Orange • Blue/Silver • Green/Red • Green/Yellow • Green/Blue • Green/White • Green/Black • Green/Orange • Green/Purple • Green/Silver • Green/Mauve • White/Red • White/Blue • White/Green • White/Black • White/Orange	

		• White/Purple • White/Mauve • White/Light Blue • White/Dark Blue • White/Light Green • White/Dark Green • White/Hot Pink • Black/Red • Black/Yellow • Black/Blue • Black/Green • Black/White • Black/Orange • Black/Silver • Black/Light Blue • Black/Dark Green • Orange/Red • Orange/Yellow • Orange/Blue • Orange/Green • Orange/White • Orange/Black • Orange/Brown • Orange/Silver • Orange/Mauve • Orange/Dark Blue • Orange/Dark Green • Orange/Hot Pink • Silver/Orange • Mauve/Red • Mauve/Yellow • Mauve/Blue • Mauve/Green • Mauve/White • Mauve/Black • Mauve/Orange • Mauve/Dark Green • Mauve/Hot Pink • Light Blue/Orange • Light Blue/Mauve • Light Blue/Dark Blue • Light Blue/Dark Green • Light Blue/Light Pink • Light Blue/Hot Pink • Dark Blue/Red • Dark Blue/Black • Dark Blue/Mauve • Dark Blue/Dark Green • Dark Blue/Light Pink • Dark Blue/Hot Pink • Light Green/Black • Light Green/Orange • Light Green/Brown • Light Green Mauve • Light Green/Light Blue • Light Green/Dark Blue • Light Green/Dark Green • Light Green/Light Pink • Light Pink/Black • Light Pink/Mauve • Light Pink/Dark Green • Hot Pink/Black • Hot Pink/Dark Blue • Hot Pink/Dark Green	

				● Hot Pink/Light Pink	
13.4.3		*aux_code_color*	Auxiliary code colors.	Faceted List (suggested): ● Black ● White	Yes
13.4.4		*aux_code*	Two-four (2-4) digit alphanumeric code found on some auxiliary markers (if present).	Alphanumeric	Yes
13.5.0	➜	measurements	Data collected is used to auto-populate metadata type 9.0.0 and related.	*(see subset of information for specific details)*	*(see subset of information for specific details)*
13.5.1		*length_inches*	Length of the bird at time of banding.	Decimal	Yes
13.5.2		*wingspan_inches*	Wingspan of the bird at time of banding.	Decimal	Yes
13.5.3		*weight_pounds*	Weight of the bird at time of banding.	Decimal	Yes
13.5.4		*age*	Age of the bird at time of banding.	Faceted List (suggested): ● Unknown ● After Hatching Year ● Hatching Year ● Juvenile ● Local ● Second Year ● After Second Year ● Third Year ● After Third Year	Yes
13.5.5		*sex*	Gender of the bird.	Faceted List (suggested): ● Unknown ● Male ● Female	Yes
13.6.0	➜	location	Data collected is used to auto-populate metadata type 11.0.0 and related.	*(see subset of information for specific details)*	*(see subset of information for specific details)*
13.6.1		*country*	Species will be categorized into the applicable country as determined by longitude and latitude data from banding record. No manual input necessary.	(suggested list): ● Africa ● Antarctica ● Argentina ● Asia ● At Sea (Ocean) ● Bahama Islands ● Belize ● Bermuda ● Bolivia ● Brazil ● Canada ● Chile ● Colombia ● Costa Rica ● Cuba	No

			• Dominican Republic and Haiti • Ecuador • El Salvador • Europe • French Guiana, Guyana and Suriname • Greenland • Guatemala • Honduras • Jamaica and Cayman Islands • Lesser Antilles • Mexico • Nicaragua • Oceana (including Hawaii), Australia, New Zealand and Philippines • Panama • Paraguay • Peru • Prince Edward Island • Puerto Rico • Russia • Unknown • United States • Venezuela	
13.6.2	*flyway*	Species will be categorized into the applicable flyway as determined by longitude and latitude data from banding record. No manual input necessary.	(suggested list): ● Atlantic ● Mississippi ● Central ● Pacific ● Alaska ● Canada ● Central America ● South America ● Caribbean	No
13.6.3	*state*	If United States or Canada is determined, species will be categorized into the applicable state (or region) as determined by longitude and latitude data from banding record. No manual input necessary.	(suggested list): ● Alabama ● Alaska ● Alberta ● Arizona ● Arkansas ● British Columbia ● California ● Colorado ● Connecticut ● Delaware ● District of Columbia ● Florida ● Georgia ● Idaho ● Illinois ● Indiana ● Iowa ● Kansas ● Kentucky ● Louisiana ● Maine ● Manitoba ● Maryland	No

			• Massachusetts • Michigan • Minnesota • Mississippi • Missouri • Montana • Nebraska • Nevada • New Brunswick • New Hampshire • New Jersey • New Mexico • New York • Newfoundland and Labrador and St. Pierre et Miquelon • North Carolina • North Dakota • Northwest Territories • Nova Scotia • Nanavut • Ohio • Oklahoma • Ontario • Oregon • Pennsylvania • Quebec • Rhode Island • Saskatchewan • South Carolina • South Dakota • Tennessee • Texas • Vermon • Virginia • Washington • West Virginia • Wisconsin • Wyoming • Yukon Territory	
13.6.4	*latitude*	Exact latitude of banding occurrence. Users will leverage a map interfaced with the Google API to help pinpoint specific location.	Decimal	No
13.6.5	*longitude*	Exact latitude of banding occurrence. Users will leverage a map interfaced with the Google API to help pinpoint specific location.	Decimal	No
13.7.0	➔ band_number	The Federal metallic band number used to identify an individual bird.	Numeric	No
14.0.0	**encounter_record**	Information regarding the encounter.	*(see subset of information for specific details)*	*(see subset of information for specific details)*

14.1.0	➔ encounter_date	Full date of bird/band encounter. (MM-DD-YYYY)	Date	No
14.2.0	➔ reporter_data	Information regarding the reporter of the encounter.	*(see subset of information for specific details)*	*(see subset of information for specific details)*
14.2.1	*reporter*	Who obtained the bird/band.	Faceted List (suggested): ● Unknown ● Finder ● State, Provincial, or Federal ● Bird Bander ● US Parts Collection Survey ● US Hunger Mail Questionnaire Survey ● Canadian Parts Collection Survey ● Canadian Hunter Mail Questionnaire Survey ● Special Mail Questionnaire Survey ● Special Parts Collection Survey	No
14.2.2	*bander_permit*	Permit number of bander. Required if Bird Bander is selected as the reporter. (Related to metadata type 13.2.0)	Numeric	Yes

14.2.3	*how_obtained*	Circumstances surrounding the encounter of a bird or band. Filter based on user input.	Faceted List (suggested):
			● Found Dead
			  ○ Hit by vehicle
			  ○ Found on road or highway
			  ○ Hit by train
			  ○ Hit by aircraft
			  ○ Oil or tar
			  ○ Disease
			  ○ Poisoning
			  ○ Struck wind turbine
			  ○ Struck tower or wires
			  ○ Struck building
			  ○ Killed by cat
			  ○ Killed by predator (other than cat)
			  ○ Died in nest
			  ○ Found band on bone/skeleton
			  ○ In building or enclosure
			  ○ Entanglement in fishing gear
			  ○ Fall from nest
			  ○ Unknown cause
			● Shot
			  ○ Unknown
			  ○ Hunting season
			  ○ Control operation
				No

			● Caught Due to Injury 　○ Hit by vehicle 　○ Found on road or highway 　○ Hit by train 　○ Hit by aircraft 　○ Oil or tar 　○ Disease 　○ Poisoning 　○ Struck wind turbine 　○ Struck tower or wires 　○ Struck building 　○ Killed by cat 　○ Killed by predator (other than cat) 　○ Died in nest 　○ Found band on bone/skeleton 　○ In building or enclosure 　○ Entanglement in fishing gear 　○ Fall from nest 　○ Exhaustion 　○ Unknown cause ● Caught by Traps / Snares (other than devices used to catch birds for banding) ● Caught by Hand 　○ Hit by vehicle 　○ Found on road or highway 　○ Hit by train 　○ Hit by aircraft 　○ Oil or tar 　○ Disease 　○ Poisoning 　○ Struck wind turbine 　○ Struck tower or wires 　○ Struck building 　○ Caught by cat 　○ Caught by predator (other than cat) 　○ Died in nest 　○ Found band on bone/skeleton 　○ In building or enclosure 　○ Entanglement in fishing gear 　○ Fall from nest 　○ Collected for a scientific project. 　○ Unknown cause ● Sight Record 　○ Identified by color band, marked plumage or marker other than standard 　○ Band read by telescope or other	

			means • Previously banded bird trapped and released during banding operations • Purchased (e-Bay, traded, etc) • Band or band number obtained only. No further information available.	
14.3.0	➔ bird_status	Describes the condition of the bird at the time of encounter. Pre-populate based on user input for metadata type 14.3.2.	Faceted List (suggested): • Alive • Alive - in captivity • Alive - released • Dead • Unknown	No
14.4.0	➔ species	Species as chosen from a type-ahead faceted list or through the bird identification assistance tool. (Related to metadata type 3.0.0)	Faceted List (list of all birds with a record in the database)	No
14.5.0	➔ banding_data	Information pertaining to the band itself.	*(see subset of information for specific details)*	*(see subset of information for specific details)*
14.5.1	*band_status*	Describes the condition of the band at the time of encounter.	Faceted List (suggested): • Left on bird • Removed from bird • Unknown	No
14.5.2	*reward_number*	Reward band number (if present). (Related to metadata type 13.3.4)	Numeric	Yes
14.6.0	➔ marking_data	Auxiliary, tracking device, and dy information (if present). (Related to 13.4.0)	*(see subset of information for specific details)*	*(see subset of information for specific details)*
14.6.1	*aux_type*	See metadata type 13.4.1 for faceted list.		No
14.6.2	*aux_color*	See metadata type 13.4.2 for faceted list.		No
14.6.3	*aux_code_color*	See metadata type 13.4.3 for faceted list.		No
14.6.4	*aux_code*	Two-four (2-4) digit alphanumeric code found on some auxiliary markers.	Alphanumeric	No
14.7.0	➔ location	Data collected is used to auto-populate metadata type 11.0.0 and related.	*(see subset of information for specific details)*	*(see subset of information for specific details)*
14.7.1	*country*	See metadata type 13.6.1 for faceted list.		No

14.7.2	*flyway*	See metadata type 13.6.2 for faceted list.		No
14.7.3	*state*	See metadata type 13.6.3 for faceted list.		No
14.7.4	*latitude*	Exact latitude of banding occurrence. Users will leverage a map interfaced with the Google API to help pinpoint specific location.	Decimal	No
14.7.5	*longitude*	Exact latitude of banding occurrence. Users will leverage a map interfaced with the Google API to help pinpoint specific location.	Decimal	No
14.8.0	➜ band_number	The Federal metallic band number used to identify an individual bird. (Related to 13.7.0)	Numeric	No
15.0.0	**number**	A four (4) digit number used for describing birds.	Numeric	No
16.0.0	**alpha_code**	A four-six (4-6) character abbreviation of English or scientific bird names that are employed by ornithologists as shorthand to allow for quicker data entry.	Alpha Code	No
17.0.0	**taxonomic_order**	An identifier for the set of species information.	Numeric	No

Resources

https://simplea.com/Articles/What-is-Website-Taxonomy-and-Metadata

https://www.pwrc.usgs.gov/BBL/homepage/gswhy.cfm

Broader Term 1 (BT1) Common Order	Non-Preferred Broader Term (BT1a) Scientific Order	Broader Term 2 (BT2) Common Family	Non-Preferred Broader Term (BT2b) Scientific Family	Preferred Term (PT) Common Name	Non Preferred Term 1 (NPT 1) Scientific Name	Non Preferred Term 2 (NPT2) Previous Names	Length (in)	Wingspan (in)	Weight (lb)	Similar Birds (other birds in family)	Flyway Boundries	Region / State	Habitat	Nesting	Feeding Behavior	Male Primary Color	Male Secondary Color	Female Primary Color	Female Secondary Color	Bill Shape	Male Band Size	Female Band Size	Sound
Bird of Prey	Falconiformes	Falcon	Falconidae	Crested Caracara	Caracara cheriway	Audubon's Caracara	19.3–22.8	47.2	37–45.9	Osprey Turkey Vulture Zone-tailed Hawk Black Vulture		Florida Texas Arizona	Deserts	Tree	Soaring	White	Gray	White	Black	Hooked	7A	7B	Cackle
Bird of Prey	Falconiformes	Falcon	Falconidae	Gyrfalcon	Falco rusticolus		18.9–25.2	48.4	28.2–74.1	Prairie Falcon Merlin American Kestrel Peregrine Falcon Steller's Sea-Eagle Aplomado Falcon		Wyoming Montana Colorado	Mountain	Cliff	Aerial Dive	White	Gray	White	Gray	Hooked	7B	7B	Chatter
Bird of Prey	Falconiformes	Falcon	Falconidae	Peregrine Falcon	Falco peregrinus	Duck hawk	14.2–19.3	39.4–43.3	18.7–56.4	Prairie Falcon Merlin American Kestrel Gyrfalcon Eurasian Hobby Black Kite Chinese Sparrowhawk Gray-faced Buzzard Osprey (Palau)		Ohio Maryland Pennsylvania	Mountain	Cliff	Aerial Dive	Gray	Blue	Gray		Hooked	6, 7A	7A, 7B	Caw
Bird of Prey	Falconiformes	Falcon	Falconidae	Prairie Falcon	Falco mexicanus		14.6–18.5	35.4–44.5	14.8–38.8	Merlin American Kestrel Peregrine Falcon Gyrfalcon Eurasian Hobby Aplomado Falcon Eurasian Kestrel		Missouri Illinois	Grasslands	Cliff	Aerial Forager	Brown	Gray	Brown	Gray	Hooked	6, 7A, 5	7A, 7B, 6	Cackle
Seabird	Gruiformes	Crane	Gruidae	Sandhill Crane	Antigone canadensis		47.2	78.7	119.9–172.8	Great Blue Heron Tricolored Heron Whooping Crane Turkey Vulture Common Crane	Central	Maryland Wisconsin	Marsh	Ground	Probing	Gray	Rust	Gray	Rust	Dagger	8, 8A, 9	8, 8A, 9	Bugle
Seabird	Gruiformes	Crane	Gruidae	Whooping Crane	Grus americana		59.1	90.2	211.6–275.1	Great Blue Heron Tricolored Heron Sandhill Crane Turkey Vulture Common Crane		Wisconsin	Marsh	Ground	Probing	White	Red	White	Black	Dagger	9, 9V	9, 9V	Bugle
Seabird	Gruiformes	Limpkin	Aramidae	Limpkin	Aramus guarauna		25.2–28.7	39.8–42.1	31.7–45.9	Black-crowned Night-Heron Tricolored Heron Yellow-crowned Night-Heron Clapper Rail Virginia Rail King Rail White Ibis		Florida	Marsh	Ground	Probing	Brown	White	Brown	White	Dagger, curved	7A, 6	7A, 6	Squawk
Seabird	Gruiformes	Coot	Rallidae	American Coot	Fulica americana		15.5–16.9	23–25	21.2–24.7	Pied-billed Grebe Common Gallinule Purple Gallinule Sora Eurasian Coot		New York Michigan Wisconsin	Lake / Pond	Floating	Surface Dive	Gray	Black	Gray	Black	All-purpose	6, 5A, 5	6, 5A, 5	Cackle
Passerine	Cuculiformes	Cuckoo	Cuculidae	Greater Roadrunner	Geococcyx californianus		20.5–21.3	19.3	7.8–19	Black-billed Cuckoo Yellow-billed Cuckoo Long-billed Thrasher Curve-billed Thrasher Smooth-billed Ani		Texas New Mexico Arizona	Scrub	Tree	Ground Forager	Brown	Buff	Brown	Buff	All-purpose	5	5	Cluck
Passerine	Cuculiformes	Cuckoo	Cuculidae	Mangrove Cuckoo	Coccyzus minor		11–12.6	15-17	2.3–2.5	Black-billed Cuckoo Yellow-billed Cuckoo Common Cuckoo Oriental Cuckoo Smooth-billed Ani		Florida	Forest	Tree	Foliage Gleaner	Brown	Buff	Brown	Buff	Curved	2, 3, 3B	2, 3, 3B	Grunt
Passerine	Cuculiformes	Cuckoo	Cuculidae	Yellow-billed Cuckoo	Coccyzus americanus	Western Yellow-billed Cuckoo	10.2–11.8	15–16.9	1.9–2.3	Greater Roadrunner Black-billed Cuckoo Brown Thrasher Common Cuckoo Oriental Cuckoo Smooth-billed Ani Mangrove Cuckoo		Tennessee Arkansas	Open Woodl.	Tree	Foliage Gleaner	Brown	White	Brown	Gray	Curved	2, 3	2, 3	Rattle
Waterfowl	Anseriformes	Duck	Anatidae	American Wigeon	Anas americana	Baldpate, American Widgeon	16.5–23.2	33.1	19–46.9	Northern Pintail Falcated Duck Eurasean Wigeon Gadwall		Michigan Indiana	Lake/Pond	Ground	Dabbler	Gray-brown	White	Brown	Gray	Spatulate	6	6	Quack
Waterfowl	Anseriformes	Goose	Anatidae	Canada Goose	Branta canadensis		29.9–43.3	50–66.9	105.8–317.5	Brant Greater White-fronted Goose Barnacle Goose Pink-footed Goose Hawaiian Goose Cackling Goose		Missouri Illinois	Marsh	Ground	Ground Forager	Brown	Buff	Brown	Buff	Spatulate	8	8	Honk
Waterfowl	Anseriformes	Duck	Anatidae	Gadwall	Anas strepera		18.1–22.4	33.1	17.6–44.1	Mallard Northern Pintail American Wigeon American Black Duck Blue-winged Teal Eurasian Wigeon Mottled Duck Falcated Duck		Ohio Indiana	Marsh	Ground	Dabbler	Gray-brown	Black	Gray	Black	Spatulate	6	6	Chatter
Waterfowl	Anseriformes	Swan	Anatidae	Mute Swan	Cygnus olor		50–59.8	81.9–93.7	194–504.4	Trumpeter Swan Tundra Swan Whooper Swan		Kentucky Virginia	Lake / Pond	Ground	Dabbler	White	Gray	White	Gray	Spatulate	9C	9C	Silent
Waterfowl	Anseriformes	Duck	Anatidae	Wood Duck	Aix sponsa		18.5–21.3	26–28.7	16–30.4	Mallard American Wigeon Northern Shoveler Baikal Teal Falcated Duck		New York Pennsylvania	Lake/Pond	Cavity	Dabbler	Chestnut	Green	Gray	Brown	Spatulate	5A, 6, 5	5A, 6, 5	Silent
Seabird	Suliformes	Booby	Sulidae	Blue-footed Booby	Sula nebouxii		31.9	62.2	52.9–77.6	Red-footed Booby Masked Booby Brown Booby Northern Gannet		California Texas Arizona	Ocean	Ground	Aerial Dive	White	Brown	Gray	Brown	Dagger	7B, 7, 7A	7B, 7, 7A	Whistle
Seabird	Suliformes	Gannet	Sulidae	Northern Gannet	Morus bassanus	Gannet	31.9–43.3	68.9–70.5	77.6–127	Blue-footed Booby Red-footed Booby Masked Booby Brown Booby		Maryland	Ocean	Cliff	Aerial Dive	White	Brown	White	Brown	Dagger	8	8	Grunt
Seabird	Suliformes	Booby	Sulidae	Red-footed Booby	Sula sula		27.2–31.1	59.8	30–38.8	Blue-footed Booby Masked Booby Brown Booby Northern Gannet		Florida California	Ocean	Shrub	Aerial Dive	White	Brown	Gray	Brown	Dagger	7A, 7B	7A, 7B	Squawk
Seabird	Suliformes	Cormorant	Phalacrocoracidae	Double-crested Cormorant	Phalacrocorax auritus		27.6–35.4	44.9–48.4	42.3–88.2	Brandt's Cormorant Pelagic Cormorant Anhinga Red-faced Cormorant Neotropic Cormorant Great Cormorant		Maryland Wisconsin	Lake	Ground	Surface	Black	Brown	Black	Brown	Hooked Seabird	8, 7B, 7D	8, 7B, 7D	Grunt
Seabird	Suliformes	Anhinga	Anhingidae	Anhinga	Anhinga anhinga	Water-turkey, Snake-bird	29.5–37.4	42.9	46.7–47.6	Brandt's Cormorant Double-crested Cormorant Pelagic Cormorant Neotropic Cormorant Great Cormorant		Texas Alabama	Marsh	Shrub	Surface dive	Brown	Gray	Black	Brown	Dagger	7B, 8	7B, 8	Grunt
Seabird	Suliformes	Frigatebird	Fregatidae	Magnificent Frigatebird	Fregata magnificens	Man-o'-War-bird	35–44.9	85.4–88.2	35.3–67			Nebraska Iowa	Ocean	Shrub	Soaring	Brown	Orange	Brown	Orange	Hooked Seabird	7B, 7, 7A	7B, 7, 7A	Silent
Waterfowl	Podicipediformes	Grebe	Podicipedidae	Clark's Grebe	Aechmophorus clarkii		21.7–29.5	31.9–32.3	25.3–59.4	Western Grebe Pied-billed Grebe Clark's Grebe Eared Grebe Red-necked Grebe Least Grebe		California New Mexico	Marsh	Floating	Surface dive	Grey-black	White	Gray	Black	Dagger	7A, 7, 7B	7A, 7, 7B	Caw

Broader Term 1 (BT1) Common Order	Non-Preferred Broader Term (BT1a) Scientific Order	Broader Term 2 (BT2) Common Family	Non-Preferred Broader Term (BT2b) Scientific Family	Preferred Term (PT) Common Name	Non Preferred Term 1 (NPT 1) Scientific Name	Non Preferred Term 2 (NPT2) Previous Names	Length (in)	Wingspan (in)	Weight (lb)	Similar Birds (other birds in family)	Flyway Boundries	Region / State	Habitat	Nesting	Feeding Behavior	Facets							
																Male Primary Color	Male Secondary Color	Female Primary Color	Female Secondary Color	Bill Shape	Male Band Size	Female Band Size	Sound
Waterfowl	Podicipediformes	Grebe	Podicipedidae	Eared Grebe	Podiceps nigricollis	Black-necked Grebe	11.8–13.8	20.5–21.7	7.1–25.9	Western Grebe / Pied-billed Grebe / Horned Grebe / Red-necked Grebe / Least Grebe		Utah Arizona	Lake / Pond	Floating	Surface dive	Brown	Rust	Brown	Black	Dagger	5, 5A	5, 5A	Trill
Waterfowl	Podicipediformes	Grebe	Podicipedidae	Horned Grebe	Podiceps auritus	Slavonian Grebe	12.2–15	21.7–25.2	10.6–20.1	Western Grebe / Pied-billed Grebe / Clark's Grebe / Eared Grebe / Red-necked Grebe / Least Grebe		Maryland Illinois	Lake / Pond	Floating	Surface dive	Black	Yellow	Black	Brown	Dagger	6, 5, 5A	6, 5, 5A	Trill
Waterfowl	Podicipediformes	Grebe	Podicipedidae	Least Grebe	Tachybaptus dominicus		8.7–10.6		2.9–6.4	Western Grebe / Pied-billed Grebe / Clark's Grebe / Eared Grebe / Red-necked Grebe / Least Grebe		Texas	Lake / Pond	Floating	Surface dive	Gray	White	Gray	Brown	Dagger	4	4	Trill
Waterfowl	Podicipediformes	Grebe	Podicipedidae	Pied-billed Grebe	Podilymbus podiceps		11.8–15	17.7–24.4	8.9–20	Western Grebe / Pied-billed Grebe / Clark's Grebe / Eared Grebe / Red-necked Grebe / Least Grebe		Florida Texas California	Lake / Pond	Floating	Surface dive	Brown	Buff	Brown	Gray	Dagger	5, 6, 5A	5, 6, 5A	Coo
Bird of Prey	Accipitriformes	Eagle	Accipitridae	Golden Eagle	Aquila chrysaetos		27.6–33.1	72.8–86.6	105.8–216.1	Bald Eagle / Turkey Vulture / Steller's Sea-Eagle / Common Black Hawk / Harris's Hawk / Black Vulture		Utah Arizona California	Grassland	Cliff	Soaring	Brown	Gold	Brown	Gold	Hooked	9, 9A, 9C	9, 9A, 9C	Yelp
Bird of Prey	Accipitriformes	Hawk	Accipitridae	Red-tailed Hawk	Buteo jamaicensis		17.7–22	44.9–52.4	24.3–45.9	Bald Eagle / Broad-winged Hawk / Ferruginous Hawk / Northern Goshawk / Osprey / Red-shouldered Hawk / Rough-legged Hawk / Swainson's Hawk / Zone-tailed Hawk / Short-tailed Hawk		California Kansas Florida	Open Woodland	Tree	Soaring	Brown	Buff	Brown	Gray	Hooked	7B, 7D, 7A	7B, 7D, 7A	Screech
Bird of Prey	Accipitriformes	Kite	Accipitridae	White-tailed Kite	Elanus leucurus		12.6–15	40–42	10.6–12.7	Mississippi Kite / Northern Harrier / Osprey / Swallow-tailed Kite / Snail Kite / Gray Hawk	Atlantic	California Kansas Florida	Grassland	Tree	Hovering	White, Gray	Buff	Brown	Gray	Hooked	6, 5	6, 5	Screech
Bird of Prey	Accipitriformes	Vulture	Cathartidae	Black Vulture	Coragyps atratus		23.6–26.8	53.9–59.1	56.4–77.6	Bald Eagle / Golden Eagle / Osprey / Crested Caracara / Turkey Vulture / California Condor / Common Black Hawk / Zone-tailed Hawk		Texas Florida Pennsylvania	Open Woodland	Cliff	Soaring	Black	Gray	Black	Gray	Hooked	8V	8V	Grunt
Bird of Prey	Accipitriformes	Osprey	Pandionidae	Osprey	Pandion haliaetus		21.3–22.8	59.1–70.9	49.4–70.5	Bald Eagle / Mississippi Kite / Northern Harrier / White-tailed Kite / Red-tailed Hawk / Rough-legged Hawk / Crested Caracara / Turkey Vulture / California Condor / White-tailed Hawk / Short-tailed Hawk		Texas Nevada Pennsylvania	Lake / Pond	Tree	Aerial Dive	Brown	Buff	Brown	Buff	Hooked	8, 7D	8, 7D	Whistle
Near-passerine	Coraciiformes	Kingfisher	Alcedinidae	Belted Kingfisher	Megaceryle alcyon		11–13.8	18.9–22.8	4.9–6	Lewis's Woodpecker / Green Kingfisher / Ringed Kingfisher		Oregon Nebraska South Carolina	Lake / Pond	Burrow	Aerial Dive	Blue	White	Gray	Chestnut	Dagger	3A, 3B, 3	3A, 3B, 3	Trill
Waterfowl	Gaviiformes	Loon	Gaviidae	Common Loon	Gavia immer	Great Northern Diver	26–35.8	40.9–51.6	88.2–215.2	Common Loon / Arctic Loon / Yellow-billed Loon / Red-throated Loon		Alaska Oregon Wisconsin	Lake / Pond	Ground	Surface Dive	Black	White	Black	Gray	Dagger	8, 8A, 9	8, 8A, 9	Hoot
Waterfowl	Gaviiformes	Loon	Gaviidae	Pacific Loon	Gavia pacifica	Arctic Loon	22.8–29.1	43.3–50.4	35.3–88.2	Common Loon / Arctic Loon / Yellow-billed Loon / Red-throated Loon		California	Lake / Pond	Ground	Surface Dive	Gray	White	Gray	Black	Dagger	7B	7B	Hoot
Waterfowl	Gaviiformes	Loon	Gaviidae	Red-throated Loon	Gavia stellata	Red-throated Diver	20.9–27.2	39.4–47.2	35.3–95.2	Common Loon / Arctic Loon / Yellow-billed Loon / Red-throated Loon		Wisconsin Illinois	Lake / Pond	Ground	Surface Dive	Gray	White	Gray	Black	Dagger	7B	7B	Quack
Nightbird	Caprimulgiformes	Nightjar	Caprimulgidae	Common Nighthawk	Chordeiles minor		8.7–9.4	20.9–22.4	2.3–3.5	Chuck-will's-widow / Common Poorwill / Lesser Nighthawk / Eastern Whip-poor-will / Antillean Nighthawk / Buff-collared Nightjar / Common Pauraque / Mexican Whip-poor-will		California Iowa Maryland	Grassland	Ground	Aerial Forager	Brown	Black	Brown	Gray	All-purpose	1D, 2, 1A		Cluck
Nightbird	Caprimulgiformes	Nightjar	Caprimulgidae	Eastern Whip-poor-will	Antrostomus vociferus		8.7–10.2	17.7–18.9	1.5–2.3	Chuck-will's-widow / Common Poorwill / Common Nighthawk / Mexican Whip-poor-will		Illinois Oklahoma North Carolina	Open Woodland	Ground	Aerial Forager	Gray	Brown	Brown	Gray	All-purpose	1D, 2, 1A	1D, 2, 1A	Whip
Near-passerine	Caprimulgiformes	Hummingbird	Trochilidae	Blue-throated Hummingbird	Lampornis clemenciae		4.3–4.7	7.5	0.2–0.3	Broad-billed Hummingbird / Violet-crowned Hummingbird / Mexican Violetear / Plain-capped Starthroat / White-eared Hummingbird / Magnificent Hummingbird		New Mexico	Open Woodland	Tree	Hovering	Gray	Blue	Gray	Blue	Needle	X		Chirp
Near-passerine	Caprimulgiformes	Hummingbird	Trochilidae	Calliope Hummingbird	Selasphorus calliope		3.5	4.3	0.1–0.1	Anna's Hummingbird / Black-chinned Hummingbird / Broad-tailed Hummingbird / Costa's Hummingbird / Ruby-throated Hummingbird / Rufous Hummingbird / Bumblebee Hummingbird		Oregon	Open Woodland	Tree	Hovering	Green	Pink	Green	White	Needle	X		Chirp
Near-passerine	Caprimulgiformes	Hummingbird	Trochilidae	Ruby-throated Hummingbird	Archilochus colubris		2.8–3.5	3.1–4.3	0.1–0.2	Anna's Hummingbird / Allen's Hummingbird / Black-chinned Hummingbird / Broad-billed Hummingbird / Broad-tailed Hummingbird / Calliope Hummingbird / Costa's Hummingbird / Rufous Hummingbird / Beryline Hummingbird / Lucifer Hummingbird	Atlantic Mississippi	Illinois Florida	Open Woodland	Tree	Hovering	Green	Red	Green	White	Needle	X		Chirp
Near-passerine	Caprimulgiformes	Swift	Apodidae	Vaux's Swift	Chaetura vauxi		4.3	11	0.5–0.8	White-throated Swift / White-collared Swift / Chimney Swift / Black Swift / White-throated Needletail / Common Swift		Washington Oregon	Forest	Tree	Aerial Forager	Brown	Gray	Brown	Gray	All-purpose	1	1	Buzz
Near-passerine	Caprimulgiformes	Swift	Apodidae	White-throated Swift	Aeronautes saxatalis		5.9–7.1	13–14	1–1.3	White-collared Swift / Vaux's Swift / Chimney Swift / Black Swift / White-throated Needletail		Arizona New Mexico	Mountain	Cliff	Aerial Forager	Black	White	Black	White	All-purpose	2	2	Trill

Broader Term 1 (BT1) Common Order	Non-Preferred Broader Term (BT1a) Scientific Order	Broader Term 2 (BT2) Common Family	Non-Preferred Broader Term (BT2b) Scientific Family	Preferred Term (PT) Common Name	Non Preferred Term 1 (NPT 1) Scientific Name	Non Preferred Term 2 (NPT2) Previous Names	Length (in)	Wingspan (in)	Weight (lb)	Similar Birds (other birds in family)	Flyway Boundries	Region / State	Habitat	Nesting	Feeding Behavior	Male Primary Color	Male Secondary Color	Female Primary Color	Female Secondary Color	Bill Shape	Male Band Size	Female Band Size	Sound
Nightbird	Strigiformes	Barn Owl	Tytonidae	Barn Owl	Tyto alba		12.6–15.7	39.4–49.2	14.1–24.7	Barred Owl, Burrowing Owl, Short-eared Owl, Snowy Owl, Spotted Owl, Hawaiian Owl		California, Iowa, Maryland	Grassland	Building	Aerial Dive	Buff	White	Buff	Gray	Hooked	6, 7A	6, 7A	Trill
Nightbird	Strigiformes	Typical Owl	Strigidae	Eastern Screech-Owl	Megascops asio		6.3–9.8	18.9–24	4.3–8.6	Flammulated Owl, Great Horned Owl, Long-eared Owl, Northern Saw-whet Owl, Northern Pygmy-Owl, Western Screech-Owl, Whiskered Screech-Owl, Ferruginous Pygmy-Owl		Wisconsin, Iowa, Florida	Forest	Cavity	Stalking	Gray		Gray		Hooked	5, 4A, 4	5, 4A, 4	Trill
Nightbird	Strigiformes	Typical Owl	Strigidae	Great Gray Owl	Strix nebulosa		24–33.1	53.9–60.2	24.7–60	Barred Owl, Great Horned Owl, Short-eared Owl, Snowy Owl, Spotted Owl, Boreal Owl, Northern Hawk Owl		Alaska, Wisconsin	Forest	Tree	Aerial Dive	Gray		Gray		Hooked	8	8	Hoot
Nightbird	Strigiformes	Typical Owl	Strigidae	Great Horned Owl	Bubo virginianus		18.1–24.8	39.8–57.1	32.1–88.2	Barred Owl, Great Gray Owl, Long-eared Owl, Short-eared Owl, Spotted Owl, Western Screech-Owl, Northern Hawk Owl, Eastern Screech-Owl		Alaska, Maryland, Wisconsin	Open Woodl	Tree	Aerial Dive	Brown	Gray	Brown	Gray	Hooked	8, 8A, 9, 7D	8, 8A, 9, 7D	Hoot
Nightbird	Strigiformes	Typical Owl	Strigidae	Northern Pygmy-Owl	Glaucidium gnoma		6.3–7.1	15	2.1–2.5	Burrowing Owl, Flammulated Owl, Northern Saw-whet Owl, Western Screech-Owl, Boreal Owl, Elf Owl, Whiskered Screech-Owl, Ferruginous Pygmy-Owl, Eastern Screech-Owl		Nevada, Arizona, New Mexico	Forest	Cavity	Aerial Forager	Brown		Brown		Hooked	3, 3B, 3A, 4	3, 3B, 3A, 4	Hoot
Nightbird	Strigiformes	Typical Owl	Strigidae	Snowy Owl	Bubo scandiacus		20.5–28	49.6–57.1	56.4–104.1	Barn Owl, Barred Owl, Burrowing Owl, Great Gray Owl, Spotted Owl		Wisconsin, Nebraska, Illinois	Grassland	Ground	Aerial Dive	White		White		Hooked	8A, 8, 9	8A, 8, 9	Hoot
Near-passerine	Psittaciformes	Parrot	Psittacidae	Monk Parakeet	Myiopsitta monachus	Quaker Parakeet	17.7–20.9	20.9	3.2–4.2	Yellow-chevroned Parakeet, White-winged Parakeet, Red-crowned Parrot, Green Parakeet, Budgerigar		Florida, Maine, Texas	Town	Tree	Foliage Gleaner	Green	Gray	Green	Gray	Hooked	4	4	Screech
Marsh Bird	Pelecaniformes	Heron	Ardeidae	Great Blue Heron	Ardea herodias		38.2–53.9	65.7–79.1	74.1–88.2	Great Egret, Little Blue Heron, Reddish Egret, Tricolored Heron, Sandhill Crane, Whooping Crane, Roseate Spoonbill		Nevada, Arizona, Texas, Florida, Maine	Marsh	Tree	Stalking	Blue-gray	Black	Blue-gray	Black	Dagger	7B, 8	7B, 8	Yelp
Marsh Bird	Pelecaniformes	Heron	Ardeidae	Snowy Egret	Egretta thula		22–26	39.4	13.1	Great Egret, Cattle Egret, Little Blue Heron, Little Egret, White Ibis, Chinese Egret		Washington, Alabama, Florida	Marsh	Tree	Stalking	White		White		Dagger	6	6	Squawk
Marsh Bird	Pelecaniformes	Heron	Ardeidae	Tricolored Heron	Egretta tricolor	Louisiana Heron	23.6–27.6	37.4	14.6	Great Blue Heron, Green Heron, Little Blue Heron, Reddish Egret, Sandhill Crane, Whooping Crane, White-faced Ibis, Limpkin		South Carolina, Georgia, Florida, Texas	Marsh	Tree	Stalking	Gray	Blue	Gray	Blue	Dagger	6	6	Squawk
Marsh Bird	Pelecaniformes	Ibis	Threskiornithidae	Roseate Spoonbill	Platalea ajaja		28–33.9	47.2–51.2	42.3–63.5	Great Blue Heron, American Flamingo, Jabiru, White Ibis, Scarlet Ibis		Florida	Marsh	Tree	Probing	Red	Pink	Pink	White	Specialized	7B	7B	Cluck
Marsh Bird	Pelecaniformes	Ibis	Threskiornithidae	White Ibis	Eudocimus albus		22–26.8	21–27	26.5–37	Snowy Egret, Wood Stork, White-faced Ibis, Roseate Spoonbill, American White Pelican, Limpkin, Glossy Ibis, Scarlet Ibis		Florida, Alabama	Marsh	Tree	Probing	White	Black	White	Gray	Curved	6, 7A	6, 7A	Grunt
Marsh Bird	Pelecaniformes	Pelican	Pelecanidae	Brown Pelican	Pelecanus occidentalis		39.4–53.9	78.7	70.5–176.4	American White Pelican	Central Mississippi	Georgia, Florida, Texas	Ocean	Tree	Aerial Dive	Brown	White	Brown	Gray	Specialized	8A, 9, 8	8A, 9, 8	Silent
Passerine	Passeriformes	Oriole	Icteridae	Altamira Oriole	Icterus gularis	Lichtenstein's Oriole, Black-throated Oriole	8.3–9.8	14.2	1.7–2.3	Bullock's Oriole, Hooded Oriole, Baltimore Oriole, Spot-breasted Oriole, Streak-backed Oriole, Black-vented Oriole		Texas, New Mexico	Open Woodl	Tree	Foliage Gleaner	Orange	Black	Orange	Black	All-purpose	3	3	Whistle
Passerine	Passeriformes	Bushtit	Aegithalidae	Bushtit	Psaltriparus minimus		2.8–3.1	7	0.1–0.2	Juniper Titmouse, Wrentit, Oak Titmouse, Blue-gray Gnatcatcher, Verdin, Bridled Titmouse, Mountain Chickadee		California, Nevada, Utah, Arizona	Scrub	Tree	Foliage Gleaner	Gray	Brown	Gray	Buff	All-purpose	0A, 0	0A, 0	Trill
Passerine	Passeriformes	Bunting	Cardinalidae	Indigo Bunting	Passerina cyanea		4.7–5.1	7.5–8.7	0.4–0.6	Painted Bunting, Blue Grosbeak, Mountain Bluebird, Varied Bunting, Blue Bunting	Central Mississippi	Arizona, Texas, Iowa, Maine	Open Woodl	Shrub	Foliage Gleaner	Blue		Blue		Cone	1, 1C, 0	1, 1C, 0	Warble
Passerine	Passeriformes	Creeper	Certhiidae	Brown Creeper	Certhia americana		4.7–5.5	6.7–7.9	0.2–0.4	Pygmy Nuthatch, Black-and-white Warbler, Red-breasted Nuthatch, White-breasted Nuthatch, Brown-headed Nuthatch	Atlantic Mississippi	Nevada, Montana, Missouri, Maine	Forest	Tree	Bark Forager	Brown	White	Brown	Gray	Curved	0A, 0	0A, 0	Warble
Passerine	Passeriformes	Dipper	Cinclidae	American Dipper	Cinclus mexicanus		5.5–7.9	9	1.5–2.4	Dark-eyed Junco, European Starling, Black Phoebe, Gray Catbird		Montana, Nevada, Utah	River / Strea	Cliff	Surface dive	Dark gray		Dark gray		All-purpose	2, 1D, 1A	2, 1D, 1A	Chatter
Passerine	Passeriformes	Towhee	Emberizidae	Eastern Towhee	Pipilo erythrophthalmus		6.8–8.2	7.9–11	1.1–1.8	Black-headed Grosbeak, California Towhee, Spotted Towhee, Dark-eyed Junco, Rose-breasted Grosbeak		Colorado, Arizona, New Mexico	Scrub	Ground	Ground Forager	Black	Rust	Black	Rust	Cone	1A, 1D, 2	1A, 1D, 2	Trill
Passerine	Passeriformes	Sparrow	Emberizidae	Harris's Sparrow	Zonotrichia querula		6.7–7.9	10.6	0.9–1.7	White-crowned Sparrow, Golden-crowned Sparrow, Black-throated Sparrow, White-throated Sparrow		Kansas, Oklahoma	Forest	Ground	Ground Forager	Brown	Buff	Brown	Gray	Cone	1A	1A	Chatter

Facets (spanning: Flyway Boundries, Region / State, Habitat, Nesting, Feeding Behavior, Male Primary Color, Male Secondary Color, Female Primary Color, Female Secondary Color, Bill Shape, Male Band Size, Female Band Size, Sound)

Broader Term 1 (BT1) Common Order	Non-Preferred Broader Term (BT1a) Scientific Order	Broader Term 2 (BT2) Common Family	Non-Preferred Broader Term (BT2b) Scientific Family	Preferred Term (PT) Common Name	Non Preferred Term 1 (NPT 1) Scientific Name	Non Preferred Term 2 (NPT2) Previous Names	Length (in)	Wingspan (in)	Weight (lb)	Similar Birds (other birds in family)	Flyway Boundries	Region / State	Habitat	Nesting	Feeding Behavior	Male Primary Color	Male Secondary Color	Female Primary Color	Female Secondary Color	Bill Shape	Male Band Size	Female Band Size	Sound
Passerine	Passeriformes	Finch	Fringillidae	American Goldfinch	Spinus tristis		4.3–5.1	7.5–8.7	0.4–0.7	Lawrence's Goldfinch Lesser Goldfinch Western Tanager Yellow Warbler Bay-breasted Warbler Yellow Greenfinch Oriental Greenfinch	Atlantic Mississippi Central Pacific	Illinois Kentucky	Open Woodl.	Shrub	Foliage Gleaner	Yellow	Black	Yellow	Black	All-purpose	0, 0A, 1C, 1	0, 0A, 1C, 1	Caw
Passerine	Passeriformes	Grosbeak	Fringillidae	Pine Grosbeak	Pinicola enucleator		7.9–9.8	13	2	House Finch Purple Finch Black Rosy-Finch Gray-crowned Rosy-Finch		Idaho Montana Nevada Utah	Open Woodl.	Tree	Foliage Gleaner	Red	Gray	Red	Gray	Cone	1A, 1D	1A, 1D	Whistle
Passerine	Passeriformes	Gnatcatcher	Polioptilidae	Black-tailed Gnatcatcher	Polioptila melanura		4.3–5.1	5.5–5.9	0.2–0.2	Blue-gray Gnatcatcher California Gnatcatcher Black-capped Gnatcatcher		Arizona New Mexico	Shrub	Shrub	Foliage Gleaner	Black	Gray	Black	Gray	All-purpose	0A	0A	Screech
Passerine	Passeriformes	Gnatcatcher	Polioptilidae	Blue-gray Gnatcatcher	Polioptila caerulea		3.9–4.3	6.3	0.2–0.3	White-breasted Nuthatch Lucy's Warbler Black-tailed Gnatcatcher California Gnatcatcher Black-capped Gnatcatcher		Texas Alabama Louisiana Florida	Forest	Tree	Foliage Gleaner	White	Gray	White	Gray	All-purpose	0A	0A	Warble
Passerine	Passeriformes	Crow	Corvidae	American Crow	Corvus brachyrhynchos		15.7–20.9	33.5–39.4	11.1–21.9	Black-billed Magpie Brown Jay Yellow-billed Magpie Chihuahuan Raven Common Raven Fish Crow Tamaulipas Crow Eurasian Jackdaw Northwestern Crow	Central Pacific	Oregon Nebraska Kentucky Maine	Open Woodl.	Tree	Ground Forager	Black		Black		All-purpose	5, 5A	5, 5A	Caw
Passerine	Passeriformes	Jay		Blue Jay	Cyanocitta cristata		9.8–11.8	13.4–16.9	2.5–3.5	Green Jay Pinyon Jay Steller's Jay Mexican Jay Island Scrub-Jay Florida Scrub-Jay Woodhouse's Scrub-Jay	Atlantic Mississippi	Illinois Alabama Virginia	Forest	Tree	Ground Forager	Blue	Gray	Blue	Gray	All-purpose	2, 3, 2A	2, 3, 2A	Screech
Passerine	Passeriformes	Kinglet	Regulidae	Golden-crowned Kinglet	Regulus satrapa		3.1–4.3	5.5–7.1	0.1–0.3	Ruby-crowned Kinglet Hutton's Vireo Blackburnian Warbler Bell's Vireo Cassin's Vireo		Washington Montana New York Maine	Forest	Tree	Foliage Gleaner	Gray	Olive	Gray	Olive	All-purpose	0A	0A	Chatter
Passerine	Passeriformes	Kinglet	Regulidae	Ruby-crowned Kinglet	Regulus calendula		3.5–4.3	6.3–7.1	0.2–0.4	Hutton's Vireo Blackburnian Warbler Bell's Vireo Golden-crowned Kinglet Cassin's Vireo	Atlantic Pacific	Arizona New Mexico	Forest	Tree	Foliage Gleaner	Tan	Olive	Tan	Olive	All-purpose	0A	0A	Chatter
Passerine	Passeriformes	Lark	Alaudidae	Horned Lark	Eremophila alpestris	Shore Lark	6.3–7.9	11.8–13.4	1–1.7	American Pipit Cassin's Sparrow Lapland Longspur Vesper Sparrow Eurasian Skylark		California South Dakota Texas	Grassland	Ground	Ground Forager	White	Brown	Gray	Brown	All-purpose	1B	1B	Rattle
Passerine	Passeriformes	Warbler	Phylloscopidae	Arctic Warbler	Phylloscopus borealis		4.3–5.1	7.75	0.4	Dusky Warbler Lanceolated Warbler Middendorff's Grasshopper-Warbler Olive-backed Pipit		Alaska	Forest	Ground	Foliage Gleaner	Green	Brown	Olive	Brown	All-purpose	0A, 0	0A, 0	Trill
Passerine	Passeriformes	Longspur	Calcariidae	Chestnut-collared Longspur	Calcarius ornatus		5.1–6.7		0.6–0.8	American Pipit Lincoln's Sparrow McCown's Longspur Lapland Longspur Smith's Longspur		Montana South Dakota Texas	Grassland	Ground	Ground Forager	Brown	Black	Brown	Black	Cone	1, 1C	1, 1C	Whistle
Passerine	Passeriformes	Thrasher	Mimidae	Brown Thrasher	Toxostoma rufum		9.1–11.8	11.4–12.6	2.2–3.1	Wood Thrush Bendire's Thrasher Long-billed Thrasher Curve-billed Thrasher Akohekohe	Atlantic	Louisiana Alabama Florida	Scrub	Shrub	Ground Forager	Brown	Buff	Brown	Gray	Medium	2, 3	2, 3	Rattle
Passerine	Passeriformes	Mockingbird	Mimidae	Northern Mockingbird	Mimus polyglottos		8.3–10.2	12.2–13.8	1.6–2	Brown Thrasher Pyrrhuloxia Bendire's Thrasher Long-billed Thrasher Townsend's Solitaire Aztec Thrush Northern Wheatear		Arizona Florida North Carolina	Town	Shrub	Ground forager	Gray		Gray		All-purpose	2, 1D, 1A	2, 1D, 1A	Cackle
Passerine	Passeriformes	Nuthatch	Sittidae	Red-breasted Nuthatch	Sitta canadensis	Canada Nuthatch	4.3	7.1–7.9	0.3–0.5	Pygmy Nuthatch Brown Creeper White-breasted Nuthatch Black-capped Chickadee Brown-headed Nuthatch Mountain Chickadee Red-cheeked Cordonbleu	Atlantic Mississippi Central Pacific	Colorado	Forest	Cavity	Bark Forager	Gray	Rust	Gray	Rust	All-purpose	0, 1C, 1	0, 1C, 1	Chirp
Passerine	Passeriformes	Nuthatch	Sittidae	White-breasted Nuthatch	Sitta carolinensis		5.1–5.5	7.9–10.6	0.6–1.1	Pygmy Nuthatch Brown Creeper Blue-gray Gnatcatcher Red-breasted Nuthatch Tufted Titmouse Black-capped Chickadee Brown-headed Nuthatch Carolina Chickadee	Mississippi	Nevada Kentucky Tennessee	Forest	Cavity	Bark Forager	White	Gray	White	Gray	All-purpose	1B, 1, 1C	1B, 1, 1C	Whistle
Passerine	Passeriformes	Sparrow	Passeridae	Eurasian Tree Sparrow	Passer montanus		5.5–5.9	7.9–8.7	0.6–1	House Sparrow Song Sparrow Chipping Sparrow Black-throated Sparrow		Virginia North Carolina	Town	Cavity	Ground Forager	Brown	Buff	Brown	Gray	Cone	1, 1B, 1C	1, 1B, 1C	Chirp
Passerine	Passeriformes	Sparrow	Passeridae	House Sparrow	Passer domesticus		5.9–6.7	7.5–9.8	1–1.1	Song Sparrow Dickcissel Chipping Sparrow Black-throated Sparrow Harris's Sparrow Lark Sparrow		Washington Colorado Kentucky Maine	Town	Cavity	Ground Forager	Brown		Brown		Cone	1B, 1	1B, 1	Chirp
Passerine	Passeriformes	Vireo	Platalea ajaja	Red-eyed Vireo	Vireo olivaceus		4.7–5.1	9.1–9.8	0.4–0.9	Warbling Vireo Black-throated Blue Warbler Tennessee Warbler Philadelphia Vireo Swainson's Warbler Yellow-green Vireo Black-whiskered Vireo		Arkansas Tennessee	Forest	Tree	Foliage Gleaner	White	Olive	White	Olive	All-purpose	1C, 1, 0	1C, 1, 0	Chirp
Passerine	Passeriformes	Shrike	Laniidae	Loggerhead Shrike	Lanius ludovicianus		7.9–9.1	11–12.6	1.2–1.8	Brown Shrike White Wagtail Northern Shrike Northern Wheatear Scissor-tailed Flycatcher		Arizona Texas Florida	Open Woodl.	Tree	Aerial Dive	Gray		Brown		Hooked	1D, 1A, 2	1D, 1A, 2	Trill
Passerine	Passeriformes	Shrike	Laniidae	Northern Shrike	Lanius excubitor	Great Grey Shrike	9.1–9.4	11.8–13.8	2–2.8	Gray Jay Clark's Nutcracker Northern Mockingbird Loggerhead Shrike Brown Shrike White Wagtail		Idaho Wyoming Nebraska	Open Woodl.	Tree	Aerial Dive	Gray		Gray		Hooked	2, 1D	2, 1D	Warble
Passerine	Passeriformes	Swallow	Hirundinidae	Tree Swallow	Tachycineta bicolor		4.7–5.9	11.8–13.8	0.6–0.9	Cliff Swallow Northern Rough-winged Swallow Violet-green Swallow Purple Martin Bank Swallow Bahama Swallow Common House-Martin		Alabama Florida Georgia	Lake / Pond	Cavity	Aerial Forager	Blue	White	Blue	Gray	All-purpose	1, 0, 1C	1, 0, 1C	Tweet

Broader Term 1 (BT1) Common Order	Non-Preferred Broader Term (BT1a) Scientific Order	Broader Term 2 (BT2) Common Family	Non-Preferred Broader Term (BT2b) Scientific Family	Preferred Term (PT) Common Name	Non Preferred Term 1 (NPT 1) Scientific Name	Non Preferred Term 2 (NPT2) Previous Names	Length (in)	Wingspan (in)	Weight (lb)	Similar Birds (other birds in family)	Flyway Boundries	Region / State	Habitat	Nesting	Feeding Behavior	Male Primary Color	Male Secondary Color	Female Primary Color	Female Secondary Color	Bill Shape	Male Band Size	Female Band Size	Sound
Passerine	Passeriformes	Swallow	Hirundinidae	Violet-green Swallow	Tachycineta thalassina		4.7	10.6	0.5	Tree Swallow, Cliff Swallow, Northern Rough-winged Swallow, Purple Martin, Bank Swallow, Bahama Swallow, Common House-Martin		Washington California	Open Woodla	Cavity	Aerial Forager	Green	White	Green	Gray	All-purpose	1, 0, 1C	1, 0, 1C	Tweet
Passerine	Passeriformes	Thrush	Turdidae	Varied Thrush	Ixoreus naevius		7.5–10.2	13.4–15	2.3–3.5	Western Bluebird, American Robin, Eastern Bluebird, Aztec Thrush, Rufous-backed Robin, Eyebrowed Thrush, Dusky Thrush, White-rumped Shama		Washington Oregon	Forest	Tree	Ground Forager	Gray	Rust	Gray	Rust	All-purpose	2	2	Whistle
Passerine	Passeriformes	Bushtit	Paridae	Black-capped Chickadee	Poecile atricapillus		4.7–5.9	6.3–8.3	0.3–0.5	Brown-headed Nuthatch, Boreal Chickadee, Gray-headed Chickadee, Bridled Titmouse, Mountain Chickadee, Mexican Chickadee, Carolina Chickadee	Atlantic Mississippi	Washington Colorado Maine	Forest	Cavity	Foliage Gleaner	Gray		Gray		All-purpose	0, 0A, 1C, 1	0, 0A, 1C, 1	Buzz
Passerine	Passeriformes	Bushtit	Paridae	Black-crested Titmouse	Baeolophus atricristatus	Tufted Titmouse	5.9	9.4	0.9	Juniper Titmouse, Oak Titmouse, Tufted Titmouse, Bridled Titmouse	Mississippi	Texas	Forest	Cavity	Foliage Gleaner	Gray		Gray		All-purpose	1B	1B	Cackle
Passerine	Passeriformes	Flycatcher	Tyrannidae	Acadian Flycatcher	Empidonax virescens		5.9	9.1	0.4 - 0.5	Willow Flycatcher, Alder Flycatcher, Least Flycatcher, Eastern Phoebe, Yellow-bellied Flycatcher, Japanese White-eye		Missouri Louisiana Georgia	Forest	Tree	Flycatching	Green		Green		All-purpose	0A, 0	0A, 0	Rattle
Passerine	Passeriformes	Flycatcher	Tyrannidae	Alder Flycatcher	Empidonax alnorum	Trail's Flycatcher	5.1–6.7	8.3–9.4	0.4–0.5	Gray Flycatcher, Hammond's Flycatcher, Willow Flycatcher, Eastern Wood-Pewee, Least Flycatcher, Acadian Flycatcher, Yellow-bellied Flycatcher		Montana Minnesota Pennsylvania	Scrub	Shrub	Flycatching	Olive		Olive		All-purpose	0A, 0	0A, 0	Buzz
Passerine	Passeriformes	Verdin	Remizidae	Verdin	Auriparus flaviceps		3.5–4.3	6.5–7	0.2–0.3	Bushtit, Chestnut-backed Chickadee, Juniper Titmouse, Wrentit, Lucy's Warbler, Olive Warbler		Arizona	Scrub	Shrub	Foliage Gleaner	Gray		Gray		All-purpose	0A, 0	0A, 0	Yelp
Passerine	Passeriformes	Vireo	Vireonidae	Philadelphia Vireo	Vireo philadelphicus		4.3–5.1	8-9	0.4–0.5	Warbling Vireo, Orange-crowned Warbler, Tennessee Warbler, Red-eyed Vireo, Yellow-green Vireo, Black-whiskered Vireo		Minnesota Wisconsin	Forest	Tree	Foliage Gleaner	Yellow	Green	Yellow	Olive	All-purpose	0, 0A	0, 0A	Chirp
Passerine	Passeriformes	Vireo	Vireonidae	White-eyed Vireo	Vireo griseus		4.3–5.1	6.7	0.4–0.5	Pine Warbler, Yellow-throated Vireo, Blue-headed Vireo, Bell's Vireo, Black-capped Vireo, Thick-billed Vireo		Louisiana Florida	Scrub	Shrub	Foliage Gleaner	Gray	Yellow	Gray	Buff	All-purpose	1, 1C, 0	1, 1C, 0	Chirp
Passerine	Passeriformes	Waxwing	Bombycillidae	Bohemian Waxwing	Bombycilla garrulus		6.3–7.5	13	1.6–2.4	Cedar Waxwing, European Starling, Phainopepla, Northern Cardinal	Central Pacific	Washington	Forest	Tree	Foliage Gleaner	Gray		Gray		All-purpose	1A	1A	Warble
Passerine	Passeriformes	Waxwing	Bombycillidae	Cedar Waxwing	Bombycilla cedrorum		5.5–6.7	8.7–11.8	1.1	European Starling, Phainopepla, Northern Cardinal, Bohemian Waxwing	Central Pacific	Washington Michigan Pennsylvania	Open Woodla	Tree	Foliage Gleaner	Brown	Gray	Brown	Gray	All-purpose	1B	1B	Whine
Passerine	Passeriformes	Warbler	Parulidae	American Redstart	Setophaga ruticilla		4.3–5.1	6.3–7.5	0.2–0.3	Black-throated Blue Warbler, Painted Redstart, Baltimore Oriole, Eastern Towhee, Slate-throated Redstart, Colima Warbler		Illinois Ohio	Forest	Tree	Foliage Gleaner	Orange	Black	Orange	Black	All-purpose	0A, 0	0A, 0	Whistle
Passerine	Passeriformes	Warbler	Parulidae	Hooded Warbler	Setophaga citrina		5.1	8	0.3–0.4	Black-throated Green Warbler, Canada Warbler, Hermit Warbler, MacGillivray's Warbler, Mourning Warbler, Bachman's Warbler		Arkansas Georgia	Forest	Shrub	Foliage Gleaner	Yellow	Green	Yellow	Olive	All-purpose	0, 0A, 1C, 1	0, 0A, 1C, 1	Chirp
Passerine	Passeriformes	Wren	Troglodytidae	Canyon Wren	Catherpes mexicanus		4.3–5.9	7.5	0.3–0.6	Bewick's Wren, Carolina Wren, Cactus Wren, Rock Wren, House Wren		Colorado Arizona New Mexico	Mountains	Cliff	Ground Forager	Brown		Brown		All-purpose	1, 1C	1, 1C	Rattle
Passerine	Passeriformes	Wren	Troglodytidae	Marsh Wren	Cistothorus palustris	Long-billed Marsh Wren	3.9–5.5	5–5.7	0.3–0.5	Bewick's Wren, Carolina Wren, Sedge Wren, Rock Wren, House Wren		Oregon	Marsh	Shrub	Ground Forager	Brown		Brown		All-purpose	1C, 1, 0	1C, 1, 0	Chatter
Near-passerine	Columbiformes	Pigeon		Band-tailed Pigeon	Patagioenas fasciata		13–15.7	25	12.1–12.8	Rock Pigeon, Mourning Dove, Red-billed Pigeon, White-crowned Pigeon	Central Pacific	California	Forest	Tree	Foliage Gleaner	Gray	Violet	Gray	Buff	All-purpose	5, 5A	5, 5A	Hoot
Near-passerine	Columbiformes	Dove	Columbidae	Mourning Dove	Zenaida macroura		9.1–13.4	17.7	3.4–6	Band-tailed Pigeon, Rock Pigeon, Common Ground-Dove, Spotted Dove, White-winged Dove, Ruddy Ground-Dove, White-crowned Pigeon, White-tipped Dove, Zenaida Dove, Zebra Dove		Nevada Kansas Virginia	Open Woodla	Tree	Ground Forager	Brown	Buff	Brown	Gray	All-purpose	3A, 3B	3A, 3B	Coo
Near-passerine	Columbiformes	Dove	Columbidae	White-winged Dove	Zenaida asiatica		11-12	5.4	17-18	Mourning Dove, Common Ground-Dove, Spotted Dove, Eurasian Collared-Dove, Inca Dove, Oriental Turtle-Dove, Ruddy Ground-Dove, White-tipped Dove, Zenaida Dove, Zebra Dove		Florida	Open Woodla	Tree	Ground Forager	Tan	Brown	Brown	Gray	All-purpose	4, 3A	4, 3A	Hoot
Marsh Bird	Charadriiformes	Avocet	Recurvirostridae	American Avocet	Recurvirostra americana		16.9–18.5	28.3	9.7–12.3	Willet, Greater Yellowlegs, Black-necked Stilt, Lesser Yellowlegs		California	Marsh	Ground	Probing	Rust	Brown	Brown	Buff	Curved	4, 4A	4, 4A	Whine
Seabird	Charadriiformes	Puffin	Alcidae	Atlantic Puffin	Fratercula arctica		11.5-13.5	21-24	13.4	Parakeet Auklet, Tufted Puffin, Horned Puffin, Crested Auklet, Rhinoceros Auklet, Razorbill		Maine New Hampshire Connecticut	Ocean	Burrow	Surface Dive	White	Black	Gray	Black	Specialized	5	5	Grunt

Broader Term 1 (BT1) Common Order	Non-Preferred Broader Term (BT1a) Scientific Order	Broader Term 2 (BT2) Common Family	Non-Preferred Broader Term (BT2b) Scientific Family	Preferred Term (PT) Common Name	Non Preferred Term 1 (NPT 1) Scientific Name	Non Preferred Term 2 (NPT2) Previous Names	Length (in)	Wingspan (in)	Weight (lb)	Similar Birds (other birds in family)	Flyway Boundries	Region / State	Habitat	Nesting	Feeding Behavior	Male Primary Color	Male Secondary Color	Female Primary Color	Female Secondary Color	Bill Shape	Male Band Size	Female Band Size	Sound
Seabird	Charadriiformes	Gull	Laridae	Laughing Gull	Leucophaeus atricilla		15.4–18.1	36.2–47.2	7.2–13.1	Bonaparte's Gull Franklin's Gull Heermann's Gull Sabine's Gull Black-headed Gull Little Gull		Florida	Shoreline	Ground	Ground Forager	White	Gray	Gray	Buff	All-purpose	5, 4A, 4	5, 4A, 4	Hoot
Seabird	Charadriiformes	Oystercatcher	Haematopodidae	American Oystercatcher	Haematopus palliatus		15.7–17.3	32	14.1–24.7	Black Oystercatcher		South Carolina Georgia	Shorline	Ground	Probing	White	Black	White	Black	Needle	5A, 5, 6	5A, 5, 6	Trill
Seabird	Charadriiformes	Plover	Charadriidae	Black-bellied Plover	Pluvialis squatarola		11–11.4	23.2–23.6	5.6–9.8	American Golden-Plover Lesser Sand-Plover Mountain Plover Pacific Golden-Plover European Golden-Plover		California Florida	Shoreline	Ground	Ground Forager	White	Black	White	Black	All-purpose	3, 3B, 3A	3, 3B, 3A	Whistle
Marsh Bird	Charadriiformes	Stilt	Recurvirostridae	Black-necked Stilt	Himantopus mexicanus		13.8–15.4	28	4.8–7.8	American Avocet Greater Yellowlegs Lesser Yellowlegs Northern Jacana		California Florida	Shoreline	Ground	Probing	White	Black	Gray	Black	Dagger	3A, 4, 4A	3A, 4, 4A	Caw
Marsh Bird	Ciconiiformes	Stork	Ciconiidae	Wood Stork	Mycteria americana	Wood Ibis	33.5–45.3	59.1–68.9	72.3–93.1	Jabiru		Florida	Marsh	Tree	Probing	White		White		Dagger, Curved	8	8	Chatter
Near-passerine	Trogoniformes	Trogon	Trogonidae	Elegant Trogon	Trogon elegans		11	18.9	2.1–2.8	White-rumped Shama		New Mexico Texas	Forest	Cavity	Flycatching	Green	Red	Gray	Olive	Hooked	3, 2, 1D	3, 2, 1D	Chatter
Seabird	Procellariiformes	Albatross	Diomedeidae	Laysan Albatross	Phoebastria immutabilis		31.1–31.9	76.8–79.9	77.6–151.7	Black-footed Albatross Short-tailed Albatross White-capped Albatross Black-browed Albatross Yellow-nosed Albatross		Alaska California	Ocean	Ground	Soaring	Dark brown		Brown		Hooked Seabird	7B	7B	Silent
Seabird	Procellariiformes	Petrel	Procellariidae	Northern Fulmar	Fulmarus glacialis	Fulmar	15.4–19.7	39.4–44.1	15.9–35.3	Lesser Black-backed Gull Sooty Shearwater Flesh-footed Shearwater Murphy's Petrel Herald Petrel		Michigan	Ocean	Cliff	Dabbler	White	Gray	Gray		Hooked Seabird	6, 5A	6, 5A	Grunt
Seabird	Procellariiformes	Storm-Petrel	Hydrobatidae	Fork-tailed Storm-Petrel	Oceanodroma furcata		7.9	12.5	1.8–2.8	Leach's Storm-Petrel Least Storm-Petrel Black Storm-Petrel Ashy Storm-Petrel White-faced Storm-Petrel		Alaska	Ocean	Cliff	Dabbler	Blue-gray		Gray		Hooked Seabird	1B, 1A	1B, 1A	Tweet
Near-passerine	Piciformes	Woodpecker	Picidae	Acorn Woodpecker	Melanerpes formicivorus		7.5–9.1	13.8–16.9	2.3–3.2	Black-backed Woodpecker Lewis's Woodpecker Nuttall's Woodpecker Pileated Woodpecker White-headed Woodpecker Williamson's Sapsucker Red-headed Woodpecker Ivory-billed Woodpecker		Arizona New Mexico	Open Woodl	Cavity	Bark forager	Black		Black		Dagger, All-purp	2, 1D, 2A	2, 1D, 2A	Caw
Near-passerine	Piciformes	Woodpecker	Picidae	Gila Woodpecker	Melanerpes uropygialis		9.4	16.1	1.8–2.8	Northern Flicker Nuttall's Woodpecker Red-bellied Woodpecker Gilded Flicker Golden-fronted Woodpecker Ladder-backed Woodpecker		Arizona	Deserts	Cavity	Bark forager	Tan	Black	Tan	Black	Dagger, All-purp	2, 3, 2A	2, 3, 2A	Rattle
Near-passerine	Piciformes	Woodpecker	Picidae	Golden-fronted Woodpecker	Melanerpes aurifrons		8.7–10.2	16.9	2.3–3.6	Gila Woodpecker Northern Flicker Nuttall's Woodpecker Red-bellied Woodpecker Gilded Flicker Ladder-backed Woodpecker		Texas	Open Woodl	Cavity	Bark forager	White	Black	Gray	Black	Dagger, All-purp	2	2	Chatter
Near-passerine	Piciformes	Woodpecker	Picidae	Ivory-billed Woodpecker	Campephilus principalis		18.1–20.1	29.9–31.5	15.9–20.1	Acorn Woodpecker Black-backed Woodpecker Pileated Woodpecker White-headed Woodpecker Red-bellied Woodpecker		Louisiana Florida Virginia	Forest	Cavity	Bark forager	White	Black	Gray	Black	Dagger, All-purp	4	4	Trill
Near-passerine	Piciformes	Woodpecker	Picidae	Red-headed Woodpecker	Melanerpes erythrocephalus		7.5–9.1	16.5	2–3.2	Acorn Woodpecker Lewis's Woodpecker White-headed Woodpecker Red-breasted Sapsucker Yellow-bellied Sapsucker Red-bellied Woodpecker		Kentucky Georgia Virginia	Open Woodl	Cavity	Flycatching	Red	White	Red	White	Dagger, All-purp	2, 1D, 2A	2, 1D, 2A	Chirp
Near-passerine	Piciformes	Woodpecker	Picidae	Yellow-bellied Sapsucker	Sphyrapicus varius		7.1–8.7	13.4–15.7	1.5–1.9	Nuttall's Woodpecker Red-naped Sapsucker Williamson's Sapsucker Red-breasted Sapsucker Red-headed Woodpecker		New Jersey Delaware	Forest	Cavity	Bark forager	Black		Black		Dagger, All-purp	1B, 1A	1B, 1A	Whine

This XML file does not appear to have any style information associated with it. The document tree is shown below.

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              <xs:element name="reward_number" type="xs:string" minOccurs="0" maxOccurs="1"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="marking_data" minOccurs="0" maxOccurs="1">
          <xs:complexType>
```

```xml
            <xs:sequence>
              <xs:element name="aux_type" type="bbl:aux_types" minOccurs="0" maxOccurs="unbounded"/>
              <xs:element name="aux_color" type="bbl:aux_colors" minOccurs="0" maxOccurs="unbounded"/>
              <xs:element name="aux_code_color" type="bbl:aux_code_color" minOccurs="0" maxOccurs="2"/>
              <xs:element name="aux_code" type="xs:string" minOccurs="0" maxOccurs="2"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="location">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="country" type="bbl:countries" minOccurs="1" maxOccurs="1"/>
              <xs:element name="flyway" type="bbl:flyways" minOccurs="1" maxOccurs="1"/>
              <xs:element name="state" type="bbl:states" minOccurs="0" maxOccurs="1"/>
              <xs:element name="latitude" type="xs:decimal" minOccurs="1" maxOccurs="1"/>
              <xs:element name="longitude" type="xs:decimal" minOccurs="1" maxOccurs="1"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
      <xs:attribute name="band_number">
        <xs:simpleType>
          <xs:restriction base="xs:integer"/>
        </xs:simpleType>
      </xs:attribute>
    </xs:complexType>
  </xs:element>
</xs:sequence>
<xs:attribute name="scientific_name">
  <xs:simpleType>
    <xs:restriction base="xs:string"/>
  </xs:simpleType>
</xs:attribute>
<xs:attribute name="number">
  <xs:simpleType>
    <xs:restriction base="xs:integer"/>
  </xs:simpleType>
</xs:attribute>
<xs:attribute name="alpha_code">
  <xs:simpleType>
    <xs:restriction base="xs:string"/>
  </xs:simpleType>
</xs:attribute>
<xs:attribute name="taxonomic_order">
  <xs:simpleType>
    <xs:restriction base="xs:integer"/>
  </xs:simpleType>
</xs:attribute>
</xs:complexType>
```

```xml
          </xs:element>
        </xs:sequence>
        <xs:attribute name="scientific_family">
          <xs:simpleType>
            <xs:restriction base="xs:string"/>
          </xs:simpleType>
        </xs:attribute>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="scientific_order">
    <xs:simpleType>
      <xs:restriction base="xs:string"/>
    </xs:simpleType>
  </xs:attribute>
  </xs:complexType>
  </xs:element>
  </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="flyways">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="Atlantic"/>
      <xs:enumeration value="Mississippi"/>
      <xs:enumeration value="Central"/>
      <xs:enumeration value="Pacific"/>
      <xs:enumeration value="Alaska"/>
      <xs:enumeration value="Canada"/>
      <xs:enumeration value="Central America"/>
      <xs:enumeration value="South America"/>
      <xs:enumeration value="Caribbean"/>
      <xs:enumeration value="Other"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="countries">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="Africa"/>
      <xs:enumeration value="Antarctica"/>
      <xs:enumeration value="Argentina"/>
      <xs:enumeration value="Asia"/>
      <xs:enumeration value="At Sea"/>
      <xs:enumeration value="Bahama Islands"/>
      <xs:enumeration value="Belize"/>
      <xs:enumeration value="Bermuda"/>
      <xs:enumeration value="Bolivia"/>
      <xs:enumeration value="Brazil"/>
```

```xml
        <xs:enumeration value="Canada"/>
        <xs:enumeration value="Chile"/>
        <xs:enumeration value="Columbia"/>
        <xs:enumeration value="Costa Rica"/>
        <xs:enumeration value="Cuba"/>
        <xs:enumeration value="Dominican Republic and Haiti"/>
        <xs:enumeration value="Ecuador"/>
        <xs:enumeration value="El Salvador"/>
        <xs:enumeration value="Europe"/>
        <xs:enumeration value="French Guiana, Guyana and Surinam"/>
        <xs:enumeration value="Greenland"/>
        <xs:enumeration value="Guatemala"/>
        <xs:enumeration value="Honduras"/>
        <xs:enumeration value="Jamaica and Cayman Islands"/>
        <xs:enumeration value="Lesser Antilles"/>
        <xs:enumeration value="Mexico"/>
        <xs:enumeration value="Nicaragua"/>
        <xs:enumeration value="Oceania (Hawaii, Australia, New Zealand and Phillipines)"/>
        <xs:enumeration value="Panama"/>
        <xs:enumeration value="Paraguay"/>
        <xs:enumeration value="Peru"/>
        <xs:enumeration value="Puerto Rico"/>
        <xs:enumeration value="Russia"/>
        <xs:enumeration value="Unknown"/>
        <xs:enumeration value="Uruguay"/>
        <xs:enumeration value="United States"/>
        <xs:enumeration value="Venezuela"/>
      </xs:restriction>
    </xs:simpleType>
</xs:element>
<xs:element name="states">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="Alabama"/>
      <xs:enumeration value="Alaska"/>
      <xs:enumeration value="Alberta"/>
      <xs:enumeration value="Arizona"/>
      <xs:enumeration value="Arkansas"/>
      <xs:enumeration value="British Columbia"/>
      <xs:enumeration value="California"/>
      <xs:enumeration value="Colorado"/>
      <xs:enumeration value="Connecticut"/>
      <xs:enumeration value="Delaware"/>
      <xs:enumeration value="District of Columbia"/>
      <xs:enumeration value="Florida"/>
      <xs:enumeration value="Georgia"/>
      <xs:enumeration value="Idaho"/>
      <xs:enumeration value="Illinois"/>
      <xs:enumeration value="Indiana"/>
```

```xml
        <xs:enumeration value="Iowa"/>
        <xs:enumeration value="Kansas"/>
        <xs:enumeration value="Kentucky"/>
        <xs:enumeration value="Louisiana"/>
        <xs:enumeration value="Maine"/>
        <xs:enumeration value="Manitoba"/>
        <xs:enumeration value="Maryland"/>
        <xs:enumeration value="Massachusetts"/>
        <xs:enumeration value="Michigan"/>
        <xs:enumeration value="Minnesota"/>
        <xs:enumeration value="Mississippi"/>
        <xs:enumeration value="Missouri"/>
        <xs:enumeration value="Montana"/>
        <xs:enumeration value="Nebraska"/>
        <xs:enumeration value="New Brunswick"/>
        <xs:enumeration value="New Hampshire"/>
        <xs:enumeration value="New Jersey"/>
        <xs:enumeration value="New Mexico"/>
        <xs:enumeration value="New York"/>
        <xs:enumeration value="Nefoundland, Labrador and St. Pierre et Miquelon"/>
        <xs:enumeration value="North Carolina"/>
        <xs:enumeration value="North Dakota"/>
        <xs:enumeration value="Northwest Territories"/>
        <xs:enumeration value="Nova Scotia"/>
        <xs:enumeration value="Nunavut"/>
        <xs:enumeration value="Ohio"/>
        <xs:enumeration value="Oklahoma"/>
        <xs:enumeration value="Ontario"/>
        <xs:enumeration value="Oregon"/>
        <xs:enumeration value="Pennsylvania"/>
        <xs:enumeration value="Prince Edward Island"/>
        <xs:enumeration value="Quebec"/>
        <xs:enumeration value="Rhode Island"/>
        <xs:enumeration value="Saskatchewan"/>
        <xs:enumeration value="South Carolina"/>
        <xs:enumeration value="South Dakota"/>
        <xs:enumeration value="Tennessee"/>
        <xs:enumeration value="Texas"/>
        <xs:enumeration value="Utah"/>
        <xs:enumeration value="Vermont"/>
        <xs:enumeration value="Virginia"/>
        <xs:enumeration value="Washington"/>
        <xs:enumeration value="West Virginia"/>
        <xs:enumeration value="Wisconsin"/>
        <xs:enumeration value="Wyoming"/>
        <xs:enumeration value="Yukon Territory"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:element>
```

```xml
<xs:element name="band_types">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="unknown/unknown"/>
      <xs:enumeration value="aluminum/butt-end toll free"/>
      <xs:enumeration value="aluminum/lock-on toll free"/>
      <xs:enumeration value="aluminum/tall toll free"/>
      <xs:enumeration value="aluminum/butt-end new address"/>
      <xs:enumeration value="aluminum/lock-on new address"/>
      <xs:enumeration value="aluminum/rivet toll free"/>
      <xs:enumeration value="aluminum/short toll free"/>
      <xs:enumeration value="aluminum/pre-open toll free"/>
      <xs:enumeration value="aluminum/short new address"/>
      <xs:enumeration value="aluminum/rivet new address"/>
      <xs:enumeration value="aluminum/butt-end"/>
      <xs:enumeration value="aluminum/lock-on"/>
      <xs:enumeration value="aluminum/tall"/>
      <xs:enumeration value="aluminum/wrap around"/>
      <xs:enumeration value="aluminum/flipper"/>
      <xs:enumeration value="aluminum/rivet"/>
      <xs:enumeration value="aluminum/short"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="band_sizes">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="0"/>
      <xs:enumeration value="0A"/>
      <xs:enumeration value="1"/>
      <xs:enumeration value="1A"/>
      <xs:enumeration value="1B"/>
      <xs:enumeration value="1C"/>
      <xs:enumeration value="1D"/>
      <xs:enumeration value="2"/>
      <xs:enumeration value="2A"/>
      <xs:enumeration value="3"/>
      <xs:enumeration value="3A"/>
      <xs:enumeration value="3B"/>
      <xs:enumeration value="4"/>
      <xs:enumeration value="4A"/>
      <xs:enumeration value="5"/>
      <xs:enumeration value="5A"/>
      <xs:enumeration value="6"/>
      <xs:enumeration value="7"/>
      <xs:enumeration value="7A"/>
      <xs:enumeration value="7B"/>
      <xs:enumeration value="7C"/>
      <xs:enumeration value="7D"/>
```

```xml
      <xs:enumeration value="8"/>
      <xs:enumeration value="8A"/>
      <xs:enumeration value="8V"/>
      <xs:enumeration value="9"/>
      <xs:enumeration value="9A"/>
      <xs:enumeration value="9C"/>
      <xs:enumeration value="9V"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="band_statuses">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="original"/>
      <xs:enumeration value="replacement"/>
      <xs:enumeration value="additional band"/>
      <xs:enumeration value="band lost"/>
      <xs:enumeration value="band destroyed"/>
      <xs:enumeration value="banding mortality"/>
      <xs:enumeration value="removed from bird"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="aux_types">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="federal metal band"/>
      <xs:enumeration value="color leg band"/>
      <xs:enumeration value="neck collar"/>
      <xs:enumeration value="reward band"/>
      <xs:enumeration value="breast dye/paint"/>
      <xs:enumeration value="tail dye/paint"/>
      <xs:enumeration value="wing dye/paint"/>
      <xs:enumeration value="head/neck dye/paint"/>
      <xs:enumeration value="tail streamer"/>
      <xs:enumeration value="wing tag"/>
      <xs:enumeration value="back tag"/>
      <xs:enumeration value="head tag"/>
      <xs:enumeration value="nasal saddle"/>
      <xs:enumeration value="web/toe tag"/>
      <xs:enumeration value="leg flag"/>
      <xs:enumeration value="PIT tag"/>
      <xs:enumeration value="satellite/cell/GPS transmitter"/>
      <xs:enumeration value="radio transmitter"/>
      <xs:enumeration value="data logger/geolocator"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="aux_colors">
```

```xml
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="red"/>
          <xs:enumeration value="yellow"/>
          <xs:enumeration value="blue"/>
          <xs:enumeration value="green"/>
          <xs:enumeration value="white"/>
          <xs:enumeration value="black"/>
          <xs:enumeration value="orange"/>
          <xs:enumeration value="gray"/>
          <xs:enumeration value="purple"/>
          <xs:enumeration value="lavender"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="aux_code_colors">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="red"/>
          <xs:enumeration value="yellow"/>
          <xs:enumeration value="blue"/>
          <xs:enumeration value="green"/>
          <xs:enumeration value="white"/>
          <xs:enumeration value="black"/>
          <xs:enumeration value="orange"/>
          <xs:enumeration value="gray"/>
          <xs:enumeration value="purple"/>
          <xs:enumeration value="lavender"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="reporter_types">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="finder"/>
          <xs:enumeration value="bander or assistant"/>
          <xs:enumeration value="Federal, State, or Provincial official"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="obtainment_types">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="found dead"/>
          <xs:enumeration value="shot"/>
          <xs:enumeration value="caught"/>
          <xs:enumeration value="collected for scientific purposes"/>
          <xs:enumeration value="drowned"/>
          <xs:enumeration value="sight record"/>
```

```xml
        <xs:enumeration value="died in nest"/>
        <xs:enumeration value="purchased, e-Bay, traded"/>
        <xs:enumeration value="illegally taken"/>
        <xs:enumeration value="band or band number only"/>
      </xs:restriction>
    </xs:simpleType>
</xs:element>
<xs:element name="bird_statuses">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="unknown"/>
      <xs:enumeration value="dead"/>
      <xs:enumeration value="alive/released"/>
      <xs:enumeration value="alive/in captivity"/>
      <xs:enumeration value="alive/unknown"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="bird_sizes">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="small (less than 5 inches)"/>
      <xs:enumeration value="medium (5 - 9 inches)"/>
      <xs:enumeration value="large (greater than 9 inches)"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="habitats">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="coast/shoreline"/>
      <xs:enumeration value="desert"/>
      <xs:enumeration value="forest"/>
      <xs:enumeration value="grassland"/>
      <xs:enumeration value="lake/pond"/>
      <xs:enumeration value="marsh/swamp"/>
      <xs:enumeration value="mountain"/>
      <xs:enumeration value="ocean"/>
      <xs:enumeration value="open woodland"/>
      <xs:enumeration value="river/stream"/>
      <xs:enumeration value="urban"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="nesting_areas">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="building"/>
      <xs:enumeration value="burrow"/>
```

```xml
          <xs:enumeration value="cavity"/>
          <xs:enumeration value="cave"/>
          <xs:enumeration value="cliff"/>
          <xs:enumeration value="floating"/>
          <xs:enumeration value="ground"/>
          <xs:enumeration value="rock"/>
          <xs:enumeration value="shrub"/>
          <xs:enumeration value="tree"/>
        </xs:restriction>
      </xs:simpleType>
  </xs:element>
  <xs:element name="feeding_behaviors">
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="aerial diver"/>
        <xs:enumeration value="aerial forager"/>
        <xs:enumeration value="bark forager"/>
        <xs:enumeration value="dabbler"/>
        <xs:enumeration value="flycatcher"/>
        <xs:enumeration value="foliage gleaner"/>
        <xs:enumeration value="ground forager"/>
        <xs:enumeration value="hoverer"/>
        <xs:enumeration value="prober"/>
        <xs:enumeration value="soarer"/>
        <xs:enumeration value="stalker"/>
        <xs:enumeration value="surface diver"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:element>
  <xs:element name="bill_shapes">
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="all-purpose"/>
        <xs:enumeration value="cone"/>
        <xs:enumeration value="dagger"/>
        <xs:enumeration value="hooked"/>
        <xs:enumeration value="needle"/>
        <xs:enumeration value="spatulate"/>
        <xs:enumeration value="specialized"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:element>
  <xs:element name="bird_sounds">
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="bugle"/>
        <xs:enumeration value="buzz"/>
        <xs:enumeration value="cackle"/>
        <xs:enumeration value="chatter"/>
```

```xml
          <xs:enumeration value="chirp"/>
          <xs:enumeration value="cluck"/>
          <xs:enumeration value="coo"/>
          <xs:enumeration value="grunt"/>
          <xs:enumeration value="honk"/>
          <xs:enumeration value="hoot"/>
          <xs:enumeration value="melodic"/>
          <xs:enumeration value="quack"/>
          <xs:enumeration value="rattle"/>
          <xs:enumeration value="scream"/>
          <xs:enumeration value="squeak"/>
          <xs:enumeration value="squwak"/>
          <xs:enumeration value="trill"/>
          <xs:enumeration value="tweet"/>
          <xs:enumeration value="unusual"/>
          <xs:enumeration value="warble"/>
          <xs:enumeration value="whine"/>
          <xs:enumeration value="whistle"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:simpleType name="bird_colors">
      <xs:restriction base="xs:string">
        <xs:enumeration value="black"/>
        <xs:enumeration value="blue"/>
        <xs:enumeration value="blue-gray"/>
        <xs:enumeration value="blue-green"/>
        <xs:enumeration value="brown"/>
        <xs:enumeration value="buff"/>
        <xs:enumeration value="chestnut"/>
        <xs:enumeration value="dark brown"/>
        <xs:enumeration value="dark gray"/>
        <xs:enumeration value="gray"/>
        <xs:enumeration value="gray-brown"/>
        <xs:enumeration value="gray-black"/>
        <xs:enumeration value="green"/>
        <xs:enumeration value="olive"/>
        <xs:enumeration value="orange"/>
        <xs:enumeration value="pink"/>
        <xs:enumeration value="purple"/>
        <xs:enumeration value="red"/>
        <xs:enumeration value="rust"/>
        <xs:enumeration value="white"/>
        <xs:enumeration value="yellow"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:schema>
```