

Arizona Important Bird Areas Winter Grassland Bird Survey Protocol

Chestnut-collared Longspur emphasis



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Jennie MacFarland, Arizona IBA Coordinator

Bird Conservation Biologist for Tucson Audubon Society

jmacfarland@tucsonaudubon.org



Thanks to our
supporting partners:



Note For Other Groups Using This Protocol:

This protocol has been developed for the needs of the Arizona IBA Program for our winter grassland surveys in southeast Arizona. We primarily do these surveys in Las Cienegas NCA Global IBA near Sonoita, AZ and the San Rafael Grasslands Global IBA near Patagonia, AZ. We tried to make this protocol as useful to other groups and habitats as possible but keep in mind this was designed primarily for winter grassland surveys focusing on Chestnut-collared Longspurs. We are very open for this to be used in other situations and for you to modify it to fit your needs. If you do use this protocol, please let us know so we can keep track of its effectiveness and gather your comments.

Thanks to Bird Conservation of the Rockies for sharing their excellent winter grassland bird survey protocol with Tucson Audubon. We tried to make our protocol as useful to their larger survey efforts in Chihuahuan Desert Grassland habitat while still working within our system of a community science volunteer birder program. All of our data will be shared with Bird Conservation of the Rockies and any other interested partners and will be made available on eBird to contribute to larger scientific and bird conservation efforts.

Purpose of these Surveys – a rapidly declining species

Chestnut-collared Longspurs (*Calcarius ornatus*) are in rapid decline and were upgraded in 2017 to Vulnerable status by the IUCN (more info [here](#)) and both Las Cienegas NCA and San Rafael Grasslands are Global IBAs for this species. Chestnut-collared Longspurs have declined by more than 87% since 1966, with an estimated 33% decline within 2003-2015. This species also is predicted to continue to decline and we monitor them here in these important wintering grounds in SE Arizona to contribute to efforts to track their populations globally. A full article about this issue and our efforts can be seen here: <https://sonoranjv.org/chestnut-collared-longspur-arizona/>

What to Bring on Survey Day:

Warm clothes and dress in layers. It will be cold in the morning and should warm up by late morning. All should bring water/snacks, a lunch, a sun hat, sun glasses, **binoculars**, a scope if you have one (each team should have at least one scope).

Identifying Chestnut-collared Longspurs:

For this survey we will be recording all birds we encounter but the bird we are really targeting is Chestnut-collared Longspurs (CCLO in the 4 letter code for data sheet purposes). This presence of this species during the winter months made Las Cienegas NCA and San Rafael Grasslands both Global IBAs and they are a high level monitoring priority for this program.

They are quite plain looking in the winter and it is difficult to get a close look at these birds, but there are some key things to look for that aid in identification.

Behavior: They often appear as a rolling tumbling flock of brownish birds (but when they turn you can sometimes see the white of their bellies and tails) with just the slightest reddish tint to them. While horned larks fly in tight organized flocks (they remind me of a school of fish swimming) where each bird keeps a relatively straight trajectory, CCLOs sort of tumble around each other as the flock moves.



This effect is caused by what you see here above. The bird all the way to the left has closed its wings and is dropping momentarily before flapping up again. All the CCLOs in a flock do this at different times, giving the effect of kernels in a popcorn air popper. It is very distinctive when you see it and looks different from the direct, strong flight of Horned Larks.

Calls: They have a distinctive two or three note “*kiddle*” call that a flock gives nearly constantly as they fly. It is common to hear a flock before seeing them as they are audible from a surprising distance. Before survey day listen to the provided audio clips of a flock of Chestnut-collared Longspurs on the www.aziba.org website under the “Resources” tab on the [Winter Grassland Surveys](#) page. Here is the direct link: http://aziba.org/?page_id=2820 There are other helpful items here including an audio clip of Horned Larks calling which is very important to know as well for comparison purposes as they can sound similar in the field.

Other Behavior Notes: Chestnut-collared Longspurs are quite skittish and when the flock looks like it wants to land at a water source like a cattle pond in the morning, they circle down, touch ground for a moment and then quickly spiral up again. They repeat this pattern several times before either flying off or settling down if they feel safe. Sometimes while a group is swirling over a water source individuals will briefly land to drink while the flock continues to swirl and provide cover from potential predators. Surveyors have reported flocks suddenly flushing out of adjacent grassland patches when the team got out of their vehicle to check something else

Also note that flocks can be surprisingly hard to see with your naked eyes against the blue sky. The flight pattern of a flock is so loose that the birds appear as individual dots rather than a clump (like blackbirds do) and these flocks are more easily seen if you scan the sky with your binoculars. It is recommend you do this regularly throughout the morning. Below is another photo of a flock of CCLOs taken in Arizona – the way each bird is holding their wings different is a key to identifying a flock of CCLOs.



Chestnut-collared Longspur flock at Las Cienegas Global IBA by Richard Fray

Here is a link to a video that Matt Griffiths recorded in the San Rafael Grasslands of a group of Chestnut-collared Longspurs: <https://youtu.be/i02bWklCmA8> This link is also on the www.aziba.org page on Winter Grassland surveys. Notice especially their tumbling flight pattern and call notes the flock is making in this video.



Chestnut-collared Longspur Davis Pasture in Las Cienegas Global IBA by Richard Fray

The above photos also show how a flock of Chestnut-collared Longspurs moves. It gives the impression of chaos or popcorn in an air-popper which is characteristic for this species on the wintering grounds.

AZ IBA Winter Grassland Bird Survey Protocol – Several Components

The general structure of our surveys is for each team to have an assigned route that they spend their survey time traveling through with specific tasks to be done along the way. Your area is not to be surveyed by any other team and you can move anywhere within your area where road, topography and public access allow. Each team will slowly drive their assigned section of road, each team will have assigned tanks and ponds on your maps and GPS units that all need to be checked as well as assigned 200m long transect routes (more info below) but you can also stop and get out whenever you want and look for birds within your area. Please stop whenever it looks like good habitat and wait for a few minutes to listen and watch as time allows. You never know what you might kick up, and teams have flushed up flocks of Chestnut-collared Longspurs this way in the past.

The only exception to anyone recording data outside of their assigned area/route is if you encounter Chestnut-collared Longspurs. If you do then fill out a CCLO datasheet and the survey coordinator will compare this data to what the team assigned to this area found for the total results.

1) General recording of all species seen during the day by each team

Each team will keep track of all species they encounter. Feel free to clump birds of the same species into one data line. For instance if you think you observed about 40 Savannah Sparrows over ¼ of a mile, they

can all go on one line. You don't need to record every little group of the common birds separately, but can lump them into larger groups. One way to think of this is Christmas Bird Count style. **The use of eBird as a data collection tool using the free eBird app during the survey is highly encouraged.** This allows a team to create specific lists and then create a summary at the end of the day to record on Overall Species List on Route datasheet. This datasheet and all other data sheets is at the end of the protocol.

2) Documenting all Chestnut-collared Longspur Occurrences

All Chestnut-collared Longspur flocks encountered during the survey route need to be documented on the Chestnut-collared Longspur Datasheets. Each sheet has space to record two separate occurrences per printed side. You need to record a GPS point of each flock with an approx. distance of the flock location from where the point was taken. You also need to record the approx. % of the grass is Lehmann's Lovegrass within 50m in all directions from where the Chestnut-collared Longspurs were detected. Information on how to identify Lehmann's Lovegrass (a non-native grass) as well as how to identify many common grass species is at the end of this protocol. If you are able to identify any native grasses in the area there is a space on the data form to record that information. Also indicate if the CCLOs were detected at a pond/tank and also add any other notes.

3) Cattle Tank/Pond Assessments

Your team will have assigned cattle tanks and ponds to be evaluated. Any tank that is assigned by the coordinator needs to be watched for Chestnut-collared Longspur presence for at least 10 minutes. During this 10 minutes you can also fill in the other requested information about the physical properties of the cattle tank/pond. You need to record the GPS location, the % of the water's edge that "muddy edge" instead of rocky or vegetated. Also record the water quality: clear, cloudy, scummy or dry as in no water present. Also estimate the angle slope of the land at the water's edge and what % of the edge falls within each category. **Vegetation:** general categories of none, slight, moderate and thick need to be recorded for grasses and shrubs/trees within 3 feet of the water's edge and then within 50 feet of the water's edge. Also record any other observations in the Notes space. There is an example guide of cattle ponds/tanks with photos at the end of this protocol

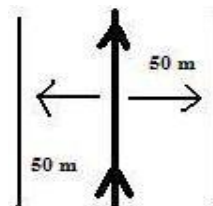


CCLOs drinking from cattle pond edge. R Fray

If you detect Chestnut-collared Longspurs at a tank be sure to indicate this in the notes section and fill out the Chestnut-collared Longspurs Datasheet with all the details of that detection.

4) 200m Transect Survey Segments

Each route will have several 200m transect segments established and mapped to be surveyed in the course of the survey activities. Each of these transect segments are GPS established and a map of each will be provided to teams. The location of these 200m Transect Survey Segments will be fixed and surveyed in exactly the same location every winter traveling east to west. This will give us comparable data over time. **Each 200m Transect Survey Segment that is surveyed goes on its own datasheet!**



How to do a Transect Survey: A Line Transect Survey involves traversing a set route with pre-determined zones of a set survey truncation distance (perpendicular distance) on either side of the traversed route, where birds are counted that are either seen or heard. A survey is one route, with a beginning point and an ending point all within one habitat type.

Begin walking. Do not record birds behind your starting point. Each 200m transect should take approximately 20 minutes to complete. This is approximate timing but should be kept in mind to set your pace.

Record an “observation” each time you encounter one or more individuals of a given species. Each bird observation gets its own data line on the datasheet (statistically important!). A flock or pair can be put together on one data line but birds of the same species that are not “together” each get their own data lines.

Transect Data Sheet. Write the location and the specific transect name at the top. Also fill out: Date, sheet number, primary observers and data sheet recorder. If the recorder is an observer, their initials go on both lines.

1. **SPECIES CODE.** Species is the first data field you fill in for each observation. You may use standard 4-letter alpha bird banding codes (we will provide), common names, or short hand names, as long as the species identified is very clear. Be careful here, there are some species that are very similar or confusing. Cactus Wren v Canyon Wren, when in doubt write more of the name down. If you do not know the 4 letter code DO NOT GUESS! Instead, use a longer abbreviation.

2. **DETECTION CODE.** Record whether the bird was detected by Audio or Visual methods by the IBA Team (write “A” or “V” or “B” for both). Auditory detections are those detections that you only hear the bird(s). Note point count methods for recording this data differ.

3. **COUNT.** Record the number of birds (of a species) you see together for each observation. This goes under the data field “count” on the datasheet.

4. **ESTIMATE.** If the “count” is an estimate, then check the “Est.?” box. Most of the time you will not be checking this box. In fact, most of your counts will be 1 (a single bird alone) or 2 (a pair of birds together- essentially in the same “spot”, e.g., same branch, tree, shrub, etc.). In cases where a large flock of birds, e.g., Lark Bunting, flushes in front of you and you never are able to get a count, but instead take a quick estimate of “300” (or you do a size grouping number estimate to give you a rough count e.g., 50-100-150-200-250-300 without actually counting) then you would check “estimate.” Also, if you have a flock moving through and you estimate the number in each little sub-group, and then added them up, that would also be an estimate.

5. **DISTANCE ZONES.** The distance recorded is the distance from the line (path of travel) to the first location an individual was observed (place a check in the appropriate column, 0-50 m, 50-100 m regardless of its behavior. If the bird subsequently moves (or is moving), do not change the original distance recorded. If a bird is flying (but not “flying over” – see below), or perched high in a tree, the distance recorded is to the point at which a plumb line would hit the ground if hung from the point at which the bird was first observed (i.e., straight line horizontal distance).

Distance needs to be recorded on ALL detections, even auditory only where you never see the bird, estimate the distance if you need to.

If the bird is in active flight when first detected, and then it stops, “lands”, in your active survey zone (within your overall truncation distance), then use this distance (where it first stops), thus where it “lands” and uses the physical habitat. If the bird just continues to fly through your area (but not a true “Fly-over”), then use the distance where you first detected it (in active flight). For auditory detections of a stationary (singing/calling) bird, use this first detection distance. For aerial foraging, use this first detection distance (regardless of a later “landing” in the habitat).

Same for a bird that starts out outside your truncation distance (a potential “Supplemental”), but then flies into your active survey area. Use the distance (distance zone) where it first enters the survey zone, except if later lands in the habitat after active flight, then use the distance to the “landed” spot.

Record the original distance of any bird that subsequently flies away (transect or point count). At a point count, any bird you flush on your arrival may be counted, and recorded at its original position within the distance zone. Write “flushed before” in the Comments.

6. SUPPLEMENTAL. If a “flyover” is observed (a bird or birds, flying significantly over the highest habitat feature within the truncation zone or area search boundaries- in route across the landscape and not foraging) during a Transect or Area Search, it is considered a Supplemental, and a count is recorded and the Supplemental column on the datasheet is “checked”. “FO” may be written in the Comments, as well. Interesting birds observed outside the truncation zone or area search boundaries, are recorded as “Supplemental”. This also applies to birds seen before or after the official survey. Supplementals are important to record as they add to the overall recorded species diversity of the area.

If birds are observed flying above the habitat (or outside the truncated zone) upon initial observation, but then subsequently fly into the habitat (tree canopy level and below) within the truncated zone, they are then not considered “supplemental birds.” Foraging birds above the habitat, within the truncated distance zone, such as swallows, raptors, vultures, and other birds, are also not considered “supplemental birds.” They are actively using the habitat (i.e., the aerial space associated with the habitat) to forage for prey.

7. MALE #/FEMALE #. Record number of males and females where discernable.

8. JUVENAL #. Record the number of juvenile birds when “young of the year” are encountered. “Young of the year” refers to young born in the current calendar (not born the previous year).

9. SUB-ADULT #. Record the number of sub-adults when they are distinguishable. Juveniles become Sub-adults on January 1 by standard convention. Sub-adults will be primarily used for raptors, and should not be used for passerines.

10. OTHER HABITAT CODE. Record the habitat type for the bird observation not in the primary habitat. Example would be a pond or patch of unusual habitat. Habitat codes provided at end of protocol.

11. BREEDING BEHAVIOR CODE. Record breeding behavior, use codes provided at the end of this larger protocol document.

12. **NEST SEEN.** If a nest is seen in relation to the encounter/observation, then record a “check” in this column..

13. **TERRITORIAL PAIR.** If a male and female are seen in close proximity and apparently associated to each other (e.g., if one bird moves, the other then joins it, or feeding together, or exhibiting any of the breeding behaviors with the opposite sex bird present), then record a “check” in this column. This is very important as data analysis can be impacted if this is not recorded correctly.

14. **COMMENT.** Use for any comments or additional information.

We encourage you to also record signs of other wildlife or signs of wildlife (e.g., tracks, scat, etc.), and record this information on the data sheet wherever space exists or on the site comment box on the cover sheet.

Note About Vegetation Surveys: The end point of each 200m Transect Survey Segment is also the location of a 50m vegetation point count. We are not asking our bird survey volunteers to do these vegetation point counts. They will be done either by volunteers with grass species identification skills or Tucson Audubon staff. Just note that this information will be collected using Bird Conservation of the Rockies protocols to contribute to their larger study in conjunction with the bird survey data you are collecting.

GPS Units – Important for these surveys

The survey coordinator provides Garmin GPS units for these surveys to get around, document where we find Chestnut-collared Longspurs and to accurately find the start and end of our 200m transects. If you are less than comfortable with this technology, please take a few minutes to watch the video I made for our cuckoo surveys - just ignore the cuckoo portions of the talk. It has great info on how to use a GPS unit. <https://www.youtube.com/watch?v=SjhlC93q86w>

Using eBird During the Surveys

I highly encourage the use of eBird and if your team would like to use the eBird App during the survey to keep track of your birds please do. Just be sure to put them all on the Overall Species List on Route datasheet at the end and that we document each individual group of Chestnut-collared Longspurs on their special datasheet with GPS location info for each flock. When you are all done an eBird list can be "shared" with all members of the group that want the list and please also share it with the username ArizonalBA - this is the Arizona Important Bird Areas Programs eBird account.

Identifying Native vrs. Non-native Grasses

Grass species community composition is very important to the overall habitat quality of Chestnut-collared Longspurs and other grassland birds. The ability to identify some of the more common native grasses and especially the non-native grass species is very important to these survey. At the end of this protocol is a grass species ID guide created specifically for these surveys in Southeast Arizona. The most vital grass species for you to identify is Lehmann’s Lovegrass. This is a non-native, invasive grass that crowds out native species while providing insufficient food for Chestnut-collared Longspurs and sparrow species.



Lehmann's Lovegrass monoculture

Assessing Cattle Tanks or Ponds – Arizona IBA Winter grassland surveys

Water sources are very important to Chestnut-collared Longspurs and other grassland birds. In our grasslands of SE AZ cattle tanks and ponds often provide this water but Chestnut-collared Longspurs seem to have very specific requirements for a cattle tank that they will use.

To gather scientific information with conservation in mind we will be assessing all tanks that we encounter during our survey for this rapidly declining species.

The main aspects we will be recording are: properties of the water's edge, water quality, fresh evidence of cattle use, vegetation within 3 feet of water's edge, vegetation within 50 feet of the water's edge.

Example #1 – Lots of vegetation



This tank is excellent for many sparrow species and has good looking water quality. This is a good example of a tank with thick vegetation all around the edge.

Example #2 – Scummy water quality, some trees



This tank has grass within three feet on about half of the water's edge and a moderate amount of mesquite trees within 50 feet of the water's edge. This is also a good example of low water quality that could be described as "scummy"

Example #3 – Temporary water source



Not an official tank this low spot has gathered a fair amount of water. Such areas are excellent for some shorebirds and could serve as a water source for sparrows and longspurs. This temporary water source has a shallow sloping edge on at least half of the water's edge, and a "slight" amount of trees within 50 feet of water's edge.

Example #4 – Muddy edge, shallow slope



This tank has a “muddy edge” all the way around and a gentle sloping edge. I have commonly referred to such edges a “ankle deep to a longspur”. This tank has grass within three feet on about half of the tank and a slight amount of trees/shrubs within 50 feet of water’s edge.

Example #5 – Steep edge



This tank has a “muddy edge” around most of its edge but the slope is very steep and 45 degrees or more. This tank has a moderate amount of grass within three feet and a moderate amount of trees/vegetation within 50 feet of water’s edge all the way around.

Example #6 – muddy edge, gentle slope and no trees/shrubs



This tank has a muddy edge all the way around, gentle slope at the water’s edge, moderate amount of grass within three feet of edge, within 50 feet no trees/shrubs and abundant grass. This tank was favored by longspurs in 2017.

Understory Guide for Arizona Important Bird Areas Winter Grassland Surveys

Amaranth



Amaranth is 1-6 feet tall with large seed heads. Native and widespread.

Beard grasses

Cane beardgrass



Beardgrasses are large bunchgrasses with hairy spikelets of inflorescence which emerge from leaf sheaths. 1-4 feet tall.

Yellow Bluestem



Lehmann Lovegrass



Example of Lehmann Lovegrass monoculture



We're mostly concerned with identifying Lehmann Lovegrass which is a **non-native** bunchgrass. Lehmann Lovegrass often grows in big patches of 1.5-2 feet tall. The inflorescence is a panicle up to 7 inches long by 3 inches wide, with branches appressed to the stems or held out at an angle.

Russian Thistle



Russian Thistle (tumbleweed) is 1-3 feet tall and bushy.

Muhly grasses

Bullgrass



Bush muhly



Muhly grasses are bushy in appearance with inflorescences forming a “cloud” around. Plant about 1-4 feet tall.

Panic grasses



Blue panic



Vine mesquite

Panic grasses can be short or tall. Inflorescences densely clustered with oval spikelets.

Bristlegrass



Grisebach



Streambed

Bristlegrass is 8-40 inches tall with densely flowered unbranched columnar inflorescences.

Johnsongrass



Johnsongrass is a large grass 3-6 feet tall.
Inflorescences reddish, large and densely flowered 6-14 inches. **Non-native**

Sacaton grass



Sacaton grass is a large, coarse-stemmed bunchgrass, 3-6 feet tall. Inflorescence open, loosely branched, 14-24 inches. This has been replanted in Las Cienegas as part of restoration efforts. Important for monsoon nesting sparrows

Tridens grasses



Slim tridens



Slim tridens



Shortleaf tridens

Tridens grass is a small bunchgrass 5-20 inches tall; inflorescences purplish, narrow and spike-like with a stacked appearance.

Grama grasses



Sprucetop grama



Sideoats grama



Santa Rita grama



Slender grama



Blue grama



Blue grama

Grama grasses vary from 3 inches to 2 feet tall with short inflorescence branches sometimes appearing as clusters of spikelets, they often have a tiny brush-like appearance.

Entered in online database on _____ by _____

AZ IBA Universal Cover Sheet

Survey Location:

Date / /

fill out observers and their hours & miles once for the day

[illegible]

*Hours on project to the X.25 hours. ** Miles driven to the nearest X.5 miles.

Transect Name (e.g. T1) or Pt. Count Route Name or Waterbody Name/Number or Area Search Name: *Use line below*

Time begin: Time end: Survey total time:

Trans. length (meters):	Dist of truncation (m):	Direction of travel(e.g. N to S):	Point Ct. Spacing (m):
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WEATHER DATA (Transect):

WEATHER DATA*(Point Count# / Waterbody# / Vantage Pt.#):

[illegible]

Wind: 0 = less than 1 mi/hr, 1 = 1 to 3, 2 = 4-7, 3 = 8 - 12, 4 = 13 to 18 (stop survey)

Clouds: 0 = <10% coverage 1 = 10%-50% 2 = 51%-90% 3 = >90% U = unknown

Princip: D=drizzle F=fog HR=hard rain LR=light rain M=mist N=none S=snow U=unk

Site Comments:

Site Comments:

Arizona IBA Winter Grassland Surveys - Chestnut-collared Longspur Datasheet

Area: _____ Route: _____ Date: _____

Use this data form to record all groups of Chestnut-collared Longspurs. Give each flock their own line

UTMs (NAD 83)	Time	# of CCLOs	Distance (meters) and direction	Lehman's Lovegrass presence within 50m in all directions ____ none ____ 30%-50% ____ less 10% ____ 50%-75% ____ 10%-30% ____ 75%-90% ____ 90%-100%	Other Grasses identified in the area.
Were the CCLOs at a tank or pond?		Other Notes:			

UTMs (NAD 83)	Time	# of CCLOs	Distance (meters) and direction	Lehmann's Lovegrass presence within 50m in all directions ____ none ____ 30%-50% ____ less 10% ____ 50%-75% ____ 10%-30% ____ 75%-90% ____ 90%-100%	Other Grasses identified in the area.
Were the CCLOs at a tank or pond?		Other Notes:			

Arizona IBA Winter Grassland Surveys – Cattle Tank/Pond Assessments

Cattle tanks and ponds are an important resource for many grassland bird species. Document the following properties of all tanks/ponds on survey.

Location: _____ Route: _____ Date: _____

UTMs of tank (NAD 83)	% of water's edge that is "muddy edge"	Slope of edge - % that falls within each category	Vegetation within 3 feet of water's edge	Vegetation within 50 feet of water's edge
		_____ % gentle slope (0 to 10%)	<u>Use:</u> none, slight, moderate, thick	<u>Use:</u> none, slight, moderate, thick
		_____ % slight slope (10% to 20%)		
		_____ % moderate slope (20% to 30%)		
		_____ % steep slope (30%-45%)		
	Water Quality	_____ % very steep (45% - 90%)	Shrubs/trees:	Shrubs/trees:
	<u>Use:</u> clear, cloudy, scummy or dry			

Notes:

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UTMs of tank (NAD 83)	% of water's edge that is "muddy edge"	Slope of edge - % that falls within each category	Vegetation within 3 feet of water's edge	Vegetation within 50 feet of water's edge
		_____ % gentle slope (0 to 10%)	<u>Use:</u> none, slight, moderate, thick	<u>Use:</u> none, slight, moderate, thick
		_____ % slight slope (10% to 20%)		
		_____ % moderate slope (20% to 30%)		
		_____ % steep slope (30%-45%)		
	Water Quality	_____ % very steep (45% - 90%)	Shrubs/trees:	Shrubs/trees:
	<u>Use:</u> clear, cloudy, scummy or dry			

Notes:

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<u>Precision of count</u>	
E	Use E if count of birds is an Estimate (e.g., large flocks).
<u>Audio/Visual Sighting</u>	
V	Bird(s) seen.
A	Bird(s) heard only.
B	Bird(s) both seen and heard.
<u>Breeding Behavior codes</u>	
P	Pair observed in suitable habitat during breeding season.
S	Individuals singing.
T	Permanent territory assumed through defense of territory.
C	Courtship behavior or copulation, includes displays and food exchange.
N	Visiting probable nest site, but no further breeding evidence obtained.
A	Agitated behavior or anxiety calls from adult.
B	Nest building by some species of wrens* (Cactus, Bewick's, House, Marsh) and Verdin or excavations by woodpeckers.
CN	Carrying nesting materials (e.g. sticks, mud and cobwebs) except
NB	Nest building on the actual next-site, except the wrens* and Verdin.
DD	Distraction display, defense of unknown nest or young, or injury feigning.
UN	Used nest or eggshells found - these must be carefully identified.
FL	Recently fledged young of altricial species incapable of sustained flight or downy young of precocial species restricted to the natal area by dependence or limited mobility.
ON	Occupied nest: adults entering or leaving a nest site in circumstances indicating an occupied nest, includes high tree, cliff or cavity/burrow nests that cannot be seen.
CF	Adult carrying food, except raptors, corvids, roadrunners, shrikes, and kingfishers.
FY	Adult feeding recently fledged young.
FS	Adult carrying fecal sack.
NE	Nest with egg(s).
NY	Nest with young seen or heard.

<u>HABITAT codes</u>	
AF	Abandoned or fallow field
AL	Alpine
AS	Aspen
CF	Coniferous mixed forest
CH	Chaparral
CL	Cliff
DS	Desert scrub
FF	Farm field
FM	Freshwater marsh (emergent veg > 50%)
GR	Grassland
HR	High elevation riparian
JU	Juniper Forest
MB	Mesquite bosque
OG	Oak-Grassland
OJ	Oak-Juniper Forest
PJ	Pinyon-Juniper Forest
PO	Pine-Oak Woodland
RC	On substrate within river channel
RD	Riparian Desert (xeric riparian vegetation)
RV	Riparian vegetation (low elev., below 4000 ft.)
RW	(in or on) River Water
UR	Urban/Suburban planted habitat
WB	(in or on) Water Body (lakes, ponds)
WE	Wetland or Waterbody Edge (shoreline)
RA	Aerial space over riparian or wetland (FM) or Waterbody (WB) - use for aerial foraging species or Fly-over bird/flocks following riparian corridor.
UN	Unknown

<u>General Behavior codes</u>	
FA	Foraging aerial
FG	Foraging ground (foraging while on the ground)
FT	Foraging tree (foraging in tree/shrub or on arboreal foliage)
FW	Foraging in/on water
P	Perched (also resting or loafing)
PP	Perched preening
PS	Perched sleeping
FLH	Flying through habitat
FLUSH	Bird(s) flush because of disturbance
FO	Fly over (not associated with habitat below).
C	Calling
SW	Swim or rest on water