

**General Instructions for Conducting
Roadside Bird Surveys,
Central Alaska Network Monitoring Program,
May 2011**



Please read this entire document before conducting your surveys. This document contains a brief background section to describe the rationale behind our sampling approach, five sections with instructions for conducting the Central Alaska Network Monitoring Programs Roadside in 2011, and one appendix.

- **Section 1.** General instructions for conducting 3-minute point counts during the 2011 CAKN roadside bird surveys (RBS).
- **Section 2.** Instructions for filling out the 2011 RBS field data sheet
- **Section 3.** Detection Codes.
- **Section 4.** List of gear for each roadside survey route, 2011
- **Section 5.** Instructions for counting adult Snowshoe Hare between survey points.
- **Appendix A:** Species list (with alpha codes) for Central Alaska Network Monitoring Program RBS.

You will all learn to do the surveys using on-the-job training by serving as scribes during your first survey. We've found this to be a very effective way of learning about the survey protocol. If you have any questions, please contact Carol McIntyre, project leader.

Background

Through the National Park Service (NPS) Vital Signs monitoring program, the Central Alaska Network Monitoring Program (CAKN) tracks the major physical drivers of ecosystem change and responses of the two major components of the biota: plants and animals (MacCluskie and Oakley 2005). CAKN identified Fauna Distribution and Abundance as one of its top three Vital Signs and the Fauna Distribution and Abundance Vital Sign includes monitoring efforts for a suite of vertebrate species including birds. Over 75% of the terrestrial vertebrates in CAKN are birds. Birds are an important component of park ecosystems and their high body temperature, rapid metabolism, and high ecological position in most food webs make them good indicators of the effects of local and regional changes in ecosystems (Fancy and Sauer 2000, O'Connell 2000, Peitz et al. 2002).

More than 70% of the bird species in CAKN are considered land birds. Land bird is a general term used for those species that live or nest primarily in terrestrial habitats. The land bird monitoring effort in CAKN will focus on a suite of species in the Order Passeriformes. These species were chosen because they are common, widely distributed, relatively easy and economical to detect, and a single survey method may detect many species.

From 1992 to 2008, many different surveys and techniques were employed to collect data on passerine birds in both on-road and off-road locations in Denali National Park and Preserve, Alaska (Denali). During these surveys, over 85% of the detections were of vocalizing (singing or calling) birds (NPS, unpublished data). Peer-review of the surveys conducted from 1992 to 1997 (NPS, unpublished data) outlined substantial issues with using raw counts for monitoring passerine birds and identified problems with the lack of a spatial sampling design. In response to the 1997 peer-review and in association with the NPS Vital Signs Monitoring Program, the Denali staff implemented major changes in the bird monitoring program in 2002 (Roland et al. 2003). These changes included the use of distance sampling, a technique used to provide estimates of detectability, and the implementation of the minigrid spatial sampling design. A recent analysis of data collected from 2002 to 2008 in Denali provided strong evidence of major violations of the assumptions of distance sampling (Hoekman et al., unpublished data). Further, new research in other areas (Alldredge 2007a, 2007b, Bachler and Liechti 2007) provided strong evidence on major violations of the assumptions of distance sampling in studies where the majority of observations (or detections) were of vocalizing (singing or calling) birds.

We have learned much about the presence and distribution of passerines in Denali from our historical work, but we needed to make substantial changes to the program to meet our primary monitoring objective of detecting change in abundance and presence over time. As such, we are proposing to use a repeated-count approach for the CAKN Passerine Monitoring Program that includes techniques that will overcome problems associated with distance sampling. A recent analysis of data collected along the Denali park road from 1993 to 1998, and in 2006, and 2009 using a repeated count approach suggests that this technique will allow us to meet our monitoring objectives (Schmidt et al., unpublished data) without violating assumptions of the data analyses techniques. Repeated counts and recently developed hierarchical N-mixture models (Royle 2004) avoid many of the problems encountered with distance sampling and unadjusted point counts by separately estimating detection probability and abundance. These mixture models build on methods developed for occupancy estimation (Royle and Nichols 2003,

MacKenzie et al. 2006) and separate the abundance process from the observation process. Further, this approach will allow us to detect changes in dates of first detections of each species, a measurement important to looking at potential impacts of a warming climate on changes in breeding season phenology for birds (Both and te Marvelde 2007).

Literature cited

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Section 1. General instructions for conducting 3-minute point counts during the 2011 CAKN roadside bird surveys (RBS).

Please follow these instructions to maintain consistency among observers when you are conducting the RBS. Please note that the survey protocols for the North American Breeding Bird Survey (BBS) and the RBS are very similar -- however there are differences between the two protocols for suspending or rescheduling your surveys when you experience weather delays and for completing the survey within a specific time. There are also substantial differences in the data sheets used for the specific surveys. Two substantial additions for the RBS are recording the time of detection and the type of detection. (BBS does not request this information). RBS also requires recording a suite of environmental data for each sampling point (BBS requests this at intervals, not at all sampling points).

It is very important that you familiarize yourself with the RBS survey routes, survey data sheets, species alpha codes, the detection codes, and the survey protocol before you start a survey. It is also very important that you are proficient at identifying all the birds that are expected to occur along any of the survey routes. If you find that you need to continually use your field guide or iPod to verify identification of birds, then you should not be doing these surveys.

PLEASE NOTE: For those who are conducting an official BBS route simultaneously with the CAKN roadside route (this includes Mel Flamme on the Eagle BBS route and Judy Williams on the Nabesna Road BBS route), please follow the BBS protocol for completing your surveys and the RBS protocols for recording time of detection and detection types during the surveys. Also, please use the CAKN RBS datasheet during the surveys and then transcribe your survey data to the BBS datasheet at the end of the survey. The BBS requires you to submit copies of your original field sheets – in this case, the original field sheets are the CAKN RBS datasheet. Please make sure to make a copy of the CAKN RBS datasheets to submit with your BBS records.

- ✓ **Start the surveys ½ hour before sunrise.** To accomplish this, you should arrive at the starting point at least 10 minutes before the start time. (BBS surveyors should follow the recommended start time provided by the BBS).
- ✓ **Complete the surveys as soon as possible.** It is important to complete the surveys during the “peak” window of activity for most species of passerine birds. In our area, this peak usually occurs from ½ hour before sunrise to about 6 hours after sunrise. From late May through June, you should strive to finish your survey by 9:30 am. Bird activity, particularly singing rates, declines rapidly after this time. (BBS surveyors should follow the BBS protocols for completing the survey within a specific time).
- ✓ **Observers.** If two people are along on the survey and both are qualified observers, you can alternate observers between points within a survey route, unless you are doing the survey as part of a BBS route.
- ✓ **Weather conditions at the start and during the surveys.** Do not conduct surveys during heavy smoke, fog, snow, heavy rain or when winds exceed 15 mph. Weather can affect bird activity and your ability to detect birds. Strive to complete your surveys under good survey conditions. Weather is often the factor that causes the most confusing during bird

surveys, particularly generating questions about should I suspend the survey because of weather conditions, and if I suspend it, should I continue it. If you experience poor survey conditions at the start or during the survey, please use the following guidelines. (BBS surveys should follow BBS instructions for weather delays).

- **At the start of the survey.** If you arrive at the starting point and experience poor survey conditions, wait up to 60 minutes for the weather to improve. If the weather does not improve after 60 minutes, then you should reschedule your survey for the next day.
- **Weather conditions during the survey.** If you experience poor survey weather after you start the survey, you should stop and wait for survey conditions to improve.
 - If weather conditions improve, you should continue the survey and complete as many sampling points as possible. It is okay if you do not complete the entire route after a weather delay – simply note this on the data sheet for the last point you complete for that particularly route.
 - If weather conditions do not improve, note this on the data sheet and suspend the survey for that day. You can return to the route within a day or two and complete the survey, starting at your next sampling point at ½ hour before sunrise.
- ✓ **Rite-in-Rain Pen.** Use a Rite-in-the-Rain pen for recording all your observations. Do not use a pencil or a “Sharpie” to record data.
- ✓ **Corrections.** If you need to change any information on the data sheet, cross out your original entry with a single line through the entry and enter the correction below.
- ✓ **Bird identification. Do not guess at bird identification.** If you are at all uncertain about the identification of a bird detected at a point, it is okay to occasionally spend time (a minute or two) after the count verifying the identification using your field guide or iPod. Verifications should not be done habitually or for extended periods. Please note: if you need to repeatedly check your field guide or iPod to verify visual or aural identification of birds you should not be conducting this survey!
- ✓ **Record the birds in the order that you detect them (specific to the CAKN RBS).** You need to record birds on the data sheet as soon as you detect them. During point counts, some people tend to count all the individuals of one species before moving on to the next species or record their detections on the circular map and then transcribe their observations to the data sheet after the survey. This approach is not compatible with our methods and should not be used during these surveys.
- ✓ **Record only those birds detected during the 3-minute point counts.** You can make a note of those species you saw before or after the count, or between points in your field notes.

- ✓ **Make sure that you use similar efforts looking and listening for birds.** Visually scan the entire point count area (360 degrees) while listening for vocalizations. Use binoculars to scan landscape especially in open habitats. Birds 200 - 400 meters distant are easily overlooked without the aid of binoculars. When doing the count without a scribe, observers tend to look at the datasheet more often than they look around the count circle. Please make sure to look up from the datasheet as often as you can. Keep eyes up and moving. Avoid looking at your data sheets for extended periods.
- ✓ **Data sheets.** Familiarize yourself with the CAKN RBS data sheets prior to conducting a point count to minimize time spent searching for species names. (BBS surveyors should check both the BBS and CAKN RBS data sheets prior to their surveys).
- ✓ **Use the sketch map to keep track of your observations.** This will help minimize double-counting individuals.
- ✓ **Count all birds seen within a 0.25-mile (400 m) radius of the sampling point except dependent young, including downy young of water and shorebirds.** You can estimate numbers of if flocks are too large to be counted. Count all birds heard regardless of suspected distance. Specific to CAKN RBS: If you hear a bird that you suspect you heard at a previous stop, record it with a P suffix on the detection code. If you suspect that the bird is greater than 400 meters from you, you should make note of this in the comments column for that observation.
- ✓ **Do not use any method of coaxing or attracting birds towards you before, during or after the 3-minute counts.**
- ✓ **Missed points.** In some cases, you may need to skip a point during a survey due to different reasons (e.g., weather, road problems, etc). This is okay and you should note that you skipped the point and the reason why.
- ✓ **Documenting Rare or Exceptional Species:** If you detect a rare species, please submit supporting documentation of the encounter. Appropriate information includes but is not limited to:
 - Field marks and/or behavioral characteristics that were used to identify the species.
 - Duration of observation (i.e. fleeting glance, a full-minute, etc.)
 - Distance from observer.
 - Type of optics used to view species.
 - Type of habitat where species was detected.
 - Breeding evidence (e.g., nest, carrying nesting material, young present, etc.)
 - References to previous breeding records for area.
- ✓ **After completing the surveys.** The primary contact for each survey is responsible for making copies of the original data sheets. When the primary contact returns to the Denali office or the Fairbanks office, they need to make a complete set of copies of the original data sheets.

- For the Denali surveys, the original data sheets should be kept in Mark and Jason's office in a safe place. The copies should be placed in Carol's mailbox at the Denali resources office.
- For the surveys in Wrangell-St. Elias and on the Taylor Highway, the original data sheets and the copies should be put in the folder in the cabinet above and to the right of Carol's computer screen. Carol will take the copies and store them in a safe place at home.

Section 2. Instructions for filling out the 2011 CAKN Roadside Bird Surveys field data sheet

A. Route, observer, scribe, and environmental measurements (top of data form).

Item	Action
DATE	Record the date of the survey.
ROUTE NAME	Record the name of the route.
POINT	Record the point number.
OBSERVER	Record the First, Middle, Last Initial, and birth year of observer (FML##).
SCRIBE	Record the First, Middle and Last Initials, and birth year of scribe (FML##).
PRIMARY WIND DIRECTION	Circle the appropriate direction.
TEMP	Record the temperature after each count, and circle the appropriate measurement unit.
WIND SPEED	Circle the appropriate estimate of wind speed.
SKY CONDITION	Circle the appropriate estimate of sky conditions.
PRECIPITATION	Circle the appropriate estimate of precipitation level.
BACKGROUND NOISE	Circle the appropriate background noise level.
SOURCE OF NOISE	Record the type of background noise (e.g., wind, insects, river, stream, vehicles, train, boat, airplane, etc).
INSECTS	Circle the appropriate estimate of the level of insects you encountered during the count.
ROAD-SIDE ONLY	
VEHICLES	Record the number of vehicles passing you during the 3-minute count.
HARES	Record the number of adult hares observed between last and current point.

B. Detections of birds (left side of form)

Column heading	Action
START TIME	Record the time of day that you started the count at the point; use the 24-hour time format (e.g. 0300).
Obs	This identifies the order that you detected the birds.
Species	Record the species alpha code for each detection.
#	Record the number of individuals for each detection. (You are recording the group size, ranging from 1 to >1).
Time	Record to the nearest second the time of the detection starting with 0:01 and ending with 3:00. (Note time format of M:SS).
DT	Detection type: record the detection type code for each observation. Only one code per observation.
COMMENTS	Record any specific comments about detections when necessary. Record other comments when necessary in the comments box at the end of the form.

C. For observers only: Use the map on the right side of the form to help you keep track of your detections. Using this map will help you minimize double counting birds.

D. Instructions for conducting the count when one person serves as observer and scribe.

1. Use the GPS to find and drive to the sample points.
2. When you reach the sample point, pull over to the side of the road, put the vehicle in park, and turn off the vehicle. Set the parking brake if necessary.
3. Get the data sheet ready, and record the number of adult hares you counted between the last point and the current point. Reset the hand-counter to zero. Set the GPS to navigate to the next sample point.
4. Get out of the vehicle with the field data sheet on the clip board, rite-in-the-rain pen, species alpha code sheet, detection type code sheet, binoculars, thermometer, compass, watch and timer.
5. Hang the thermometer on the vehicle antenna away from the engine and leave it there during the count.
6. Step away from the vehicle – do the count approximately 3 to 5 meters from the parked vehicle. (Far enough away to minimize any noises associated with the vehicle).
7. Fill in the appropriate route and observer information.
8. Before starting the count, record the primary wind direction, wind speed, and sky condition.
9. Use the compass to find north and the laser range finder to find landmarks about 400 meters around the point.
10. Record the time you start the count and start the timer.
11. Conduct the 3-minute point count. Use the sketch map on the right side of the data sheet to jot notes about locations of detections to help you avoid double counting.
12. Stop the count at the 3-minute mark.
13. Immediately after the count, record the background noise level, the source of the noise, and the insect level.
14. Retrieve the thermometer and record the temperature.
15. Check the data sheet to make sure that you recorded all the necessary data.
16. Reset your timer to zero.
17. Get back in the vehicle and proceed to the next point.

E. Instructions for conducting the count with an observer and a scribe.

It is often most useful to have the scribe drive the vehicle and have the observer help navigate with the GPS and maps.

1. Use the GPS to find the appropriate sample point. You need to be within 50 meters of the GPS point to conduct the count.
2. When you reach the point, pull over to the side of the road, put the vehicle in park, and turn off the vehicle. Set the parking brake if necessary.
3. SCRIBE: gets the data sheet ready, and records the number of adult hares counted between the last point and the current point. After recording this number, resets the hand-counter to zero.
4. Before getting out of the vehicle, SCRIBE OR OBSERVER: sets the GPS to find the next sample point.
5. OBSERVER and SCRIBE: get out of the vehicle. SCRIBE: has the “2011 CAKN Roadside-Riverside Bird Surveys” data sheet on a clipboard, two rite-in-the-rain pens, species alpha code sheet, detection type code sheet, thermometer, compass, watch and timer. OBSERVER: “2011 CAKN Roadside-Riverside Bird Surveys” datasheet on clipboard, two rite-in-the-rain pens, a laser range finder, and the compass.
6. SCRIBE: hangs the thermometer on the vehicle antenna, away from the engine.
7. BOTH: step away from the vehicle and remain within 1 meter of each other during the count, about 3 to 5 meters from the parked vehicle. SCRIBE: records the appropriate route and observer information.
8. Before the count, SCRIBE: records the primary wind direction, wind speed, and sky condition. Before the count, OBSERVER: uses a laser range finder to find landmarks that are approximately 400 meters away from the sample point and the compass to find north.
9. SCRIBE: asks the observer “are you ready” and when the observer says “yes”, SCRIBE: says “START”, records the time of day and starts the timer.
10. OBSERVER: does the survey. SCRIBE: records the survey data during the 3-minute point count. During the count the scribe must remain silent and stationary. The scribe should not walk around or make any unnecessary noise during the count or alert the observer to birds.
11. At the three minute mark, SCRIBE: says “STOP” and the count ends.
12. Immediately after the count, OBSERVER: tells the scribe the background noise level, the source of the noise, and the insect level, and the scribe records this information on the data sheet. SCRIBE: retrieves the thermometer and records the temperature on the data sheet. OBSERVER: double checks the scribe’s data sheet to make sure that the scribe recorded all the necessary data.
13. SCRIBE: resets the timer to zero; BOTH: get back in the vehicle and proceed to the next point.

Section 3. Detection Codes: This table includes the codes to use for each group of birds that you detect at each point. On the data sheet, only indicate how you first detected the bird.

Detection Code	Description	Definition
S	Singing bird	First detection was an aural observation of a singing bird.
C	Calling bird	First detection was an aural observation of a calling bird.
V	Visual observation	First detection was a visual observation of a bird perched in the count area, but not flying over or doing an aerial display.
ADA	Aerial display- aural	First detection was an observation of a bird doing an aerial display within the count circle. Birds that are commonly detected by aerial displays include Horned Lark, American Pipit, and Redpolls.
ADV	Aerial display-visual	First detection was a visual observation of a bird doing an aerial display within the count circle.
FO	Fly over	First detection was a visual or aural observation of a bird flying over the area, but does not include birds that are displaying.
DR	Drumming	First detection was of a bird that was drumming. Birds that are commonly detected by drumming include Ruffed Grouse and woodpeckers.
WI	Winnowing	First detection was of a bird that was winnowing. The only species commonly detected by winnowing is the Wilson's Snipe.
Code suffixes		
P	Detected at previous point	Regardless of the detection type, the bird was detected at the previous point.
N	Nest	First detection was of a nest
J	Juvenile	Detection of a juvenile bird.

Using the detection codes:

You should only use one detection code for each observation, unless you need to add a code suffix to indicate a bird detected at a previous point, a nest, or a juvenile. The code should refer to your initial detection of the bird. For instance, if you heard a bird singing and then saw it, your detection type would be “S” for singing. Similarly, if you first saw a bird and then heard it, your detection would be “V”, visual.

It is important to distinguish observations of birds that are flying as either “ADA” – aerial displays detected using aural (vocalizations) observations,” ADV”- aerial displays detected using visual observations, or “FO” – fly-overs (see below). Any observations (visual or aural) of birds doing aerial displays in the count circle should be recorded as ADA or ADV. In contrast, fly-overs include birds that are simply flying over the area, but are not staying in the area.

Also, it is important to distinguish between fly-overs and visual observations of flying birds. Fly-overs are defined as birds that are flying over the area and are not using the specific area. A good example of this might be a Common Raven that is flying high over you and through the count circle, but obviously not staying in the area. This type of observation is defined as a “FO”, fly-over. Birds that you observe as they are flying, but staying in the area (such as a bird flying from perch to perch) should be recorded as visual observations unless they are doing an aerial display (see above).

Code suffixes: We use three code suffixes to identify if observations of a bird at a previous point, a nest, or a juvenile (downy independent young).

Birds detected at previous points: Regardless of the detection type, if you detected the bird at the previous point, you should put a –P after the detection code. For instance, if you detected a singing bird at point 2 that you also detected at point 1, then your detection type should be “S-P”.

Nests or juveniles: We do not use observations of nests or juveniles in our data analyses, but it is important to record these observations on your field forms. If you detect a nest, record your observation using the appropriate species code and then detection type = N. If you detect a juvenile, record your observation using the appropriate species and then the detection type = J.

Section 4. List of gear for each roadside survey route, 2011

All of the gear is provided, except for the last item. You can use your own binoculars as well.

- ✓ GPS unit with sample point coordinates loaded in it.
- ✓ Vehicle power cable for GPS.
- ✓ List of points with coordinates.
- ✓ Overview map of route.
- ✓ Clipboards (one for observer, one for scribe when needed).
- ✓ Digital watch.
- ✓ Digital stopwatch.
- ✓ Compass.
- ✓ Thermometer.
- ✓ Binoculars (or bring your own).
- ✓ Fully charged iPod with bird songs of Alaska loaded on it.
- ✓ iPod charger for vehicle.
- ✓ Fieldguide: Sibley Field Guide to Western Birds.
- ✓ Data sheets for the survey with a few extra. Need 50 datasheets for observer and 50 data sheets for the scribe.
- ✓ Species code and detection type code sheets.
- ✓ Rite-in-the-rain pens (at least two with two refills).
- ✓ Hand counter for counting hares.
- ✓ Satellite phone with chargers and extra battery for surveys on McCarthy Road, Nabesna Road, and Taylor Highway.
- ✓ Handheld park radio for surveys on the Denali park road.
- ✓ Things to make the work more fun – coffee, banana bread, and a pillow and sleeping bag for after the route!

Section 5. Instructions for counting adult Snowshoe Hare between survey points.

We are experimenting with using data collected on the roadside bird surveys to track trends in Snowshoe Hare abundance.

1. Starting at Point 1: Keep track of the number of adult Snowshoe Hare observed between the survey points. In situations where hares are numerous (more than 10 between points), use a hand counter to keep track of them. Adult hare are much larger than young of the year and are usually easy to distinguish from the youngsters.

2. Record the number on the data sheet when you reach the next point. When you reach the next survey point, record the number of Snowshoe Hares that you detected along the road and roadside from the last survey point. If you need to skip a survey point, please note that on your data sheet.

Appendix A. Species list for Central Alaska Network Monitoring Program Roadside Bird Surveys, 2011. The list does not include species expected on the south side of WRST.

Species	Code	Species	Code	Species	Code	Species	Code
Greater White-fronted Goose	GWFG	American Kestrel	AMKE	Downy Woodpecker	DOWO	American Robin	AMRO
Canada Goose	CAGO	Merlin	MERL	Hairy Woodpecker	HAWO	Varied Thrush	VATH
Trumpeter Swan	TRUS	Gyr Falcon	GYRF	Three-toed Woodpecker	ATTW		
		Peregrine Falcon	PEFA	Black-backed Woodpecker	BBWO	American Pipit	AMPI
American Wigeon	AMWI			Northern Flicker	NOFL		
Mallard	MALL	Sandhill Crane	SACR			Bohemian Waxwing	BOWA
Blue-winged Teal	BWTE			Olive-sided Flycatcher	OSFL		
Northern Shoveler	NSHO	Black-bellied Plover	BBPL	Western Wood-Pewee	WEWP	Lapland Longspur	LALO
Northern Pintail	NOPI	American Golden Plover	AMGP	Yellow-bellied Flycatcher	YBFL	Smith's Longspur	SMLO
Green-winged Teal	GWTE	Semipalmated Plover	SEPL	Alder Flycatcher	ALFL	Snow Bunting	SNBU
Canvasback	CANV			Least Flycatcher	LEFL		
Redhead	REDH	Spotted Sandpiper	SPSA	Hammond's Flycatcher	HAFL	Tennessee Warbler	TEWA
Ring-necked Duck	RNDU	Solitary Sandpiper	SOSA	Say's Phoebe	SAPH	Orange-crowned Warbler	OCWA
Greater Scaup	GRSC	Wandering Tattler	WATA			Yellow Warbler	YWAR
Lesser Scaup	LESC	Greater Yellowlegs	GRYE	Northern Shrike	NSHR	Yellow-rumped Warbler	MYWA
Scaup Sp.	SCSP	Lesser Yellowlegs	LEYE			Townsend's Warbler	TOWA
Harlequin Duck	HADU	Upland Sandpiper	UPSA	Gray Jay	GRAJ	Blackpoll Warbler	BLPW
Surf Scoter	SUSC	Whimbrel	WHIM	Black-billed Magpie	BBMA	Northern Waterthrush	NOWA
Black Scoter	BLSC	Surfbird	SURF	Common Raven	CORA	Wilson's Warbler	WIWA
White-winged Scoter	WWSC	Semipalmated Sandpiper	SESA				
Long-tailed Duck	LTDU	Western Sandpiper	WESA	Horned Lark	HOLA	American Tree Sparrow	ATSP
Bufflehead	BUFF	Least Sandpiper	LESA			Chipping Sparrow	CHSP
Common Goldeneye	COGO	Baird's Sandpiper	BASA	Tree Swallow	TRES	Savannah Sparrow	SAVS
Barrow's Goldeneye	BAGO	Pectoral Sandpiper	PESA	Violet-green Swallow	VGSW	Fox Sparrow	FOSP
Common Merganser	COME	Long-billed Dowitcher	LBDO	Bank Swallow	BANS	Lincoln's Sparrow	LISP
Red-breasted Merganser	RBME	Wilson's Snipe	WISN	Cliff Swallow	CLSW	White-crowned Sparrow	WCSP
		Red-necked Phalarope	RNPH			Golden-crowned Sparrow	GCSP
Ruffed Grouse	RUGR			Black-capped Chickadee	BCCH	Dark-eyed Junco	DEJU
Spruce Grouse	SPGR	Bonaparte's Gull	BOGU	Boreal Chickadee	BOCH		
Willow Ptarmigan	WIPT	Mew Gull	MEGU			Rusty Blackbird	RUBL
Rock Ptarmigan	ROPT	Herring Gull	HERG	Red-breasted Nuthatch	RBNU		
White-tailed Ptarmigan	WTPT	Glaucous-winged Gull	GWGU			Gray-crowned Rosy Finch	GRF
		Arctic Tern	ARTE	Brown Creeper	BRCR	Pine Grosbeak	PIGR
Red-throated Loon	RTLO					White-winged Crossbill	WWCR
Pacific Loon	PALO	Long-tailed Jaeger	LTJA	American Dipper	AMDI	Redpoll species	REDP
Common Loon	COLO					Pine Siskin	PISI
Horned Grebe	HGR	Great Horned Owl	GHOW	Golden-crowned Kinglet	GCKI		
Red-necked Grebe	RNGR	Northern Hawk Owl	NOHO	Ruby-crowned Kinglet	RCKI		
		Great Gray Owl	GGOW				
Osprey	OSPR	Short-eared Owl	SEOW	Arctic Warbler	ARWA		
Bald Eagle	BAEA	Boreal Owl	BOOW				
Northern Harrier	NOHA			Northern Wheatear	NOWH		
Sharp-shinned Hawk	SSHA	Belted Kingfisher	BEKI	Mountain Bluebird	MOBL		
Northern Goshawk	NOGO			Townsend's Solitaire	TOSO		
Red-tailed Hawk	RTHA			Gray-cheeked Thrush	GCTH		
Golden Eagle	GOEA			Swainson's Thrush	SWTH		
				Hermit Thrush	HETH		
						Revised May 2011 by CLM	