

Final Report on the General Avian Inventory of Grant-Kohrs Ranch
National Historic Site, Montana

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Abstract

The National Park Service (NPS) developed a Task Agreement with the Rocky Mountain Bird Observatory (RMBO) to conduct an avian inventory of Grant-Kohrs Ranch National Historic Site (GRKO) in western Montana as part of a new service-wide emphasis on inventory and monitoring. The inventory was a component of a suite of biological inventories being conducted within the Rocky Mountain Network (ROMN). The objectives of the inventories were (1) to document the occurrence of bird species, (2) to describe the distribution and, where possible, the population densities of those species, (3) to identify critical bird habitats, (4) to identify bird species of special management concern, and (5) to recommend a long-term bird monitoring program.

To implement the inventory, in 2004 we established two habitat-stratified point count transects using distance sampling methodology (Buckland et al. 1993, Leukering et al. 2001) in both of the major habitat types of GRKO (Grassland and Riparian). We also surveyed wintering and migratory species by conducting informal bird surveys in GRKO. We used program DISTANCE (Thomas et al. 1998) to analyze the distance data and calculate population densities among different habitats for those species with sample size greater than 19 individual and independent detections. We used the Global Positioning System (GPS) to describe the distribution of each species' detections.

Field biologists conducted the point-count transects on 30 June and 1 July. During the transects, they detected a total (in both habitats combined) of 577 individual birds of 54 species. Species for which they obtained sample sizes sufficient to calculate density in individual habitats (>19 individuals) included Willow Flycatcher (n=21, Riparian), European Starling (n=20, Riparian), Yellow Warbler (n=25, Riparian), Vesper Sparrow (n=28, Grassland), Savannah Sparrow (n=76, Grassland and Riparian), Red-winged Blackbird (n=22, Riparian), Western Meadowlark (n=50, Grassland and Riparian), and Brown-headed Cowbird (n=31, Riparian). They detected four individual raptors of three species: Osprey (n=1), Red-tailed Hawk (n=1), and American Kestrel (n=2). Species that they detected in low numbers (n=1) included Canada Goose, Gadwall, Mallard, Ruddy Duck, Osprey, Red-tailed Hawk, Sora, Downy Woodpecker, Least Flycatcher, Western Kingbird, Tree Swallow, Cliff Swallow, Cedar Waxwing, and Clay-colored Sparrow.

Field biologists also conducted informal bird surveys of GRKO during the spring and fall migrations, and during winter. Results of those surveys are reflected in the GRKO bird checklist (Appendix C).

The following species that were documented during the inventory are listed in the Montana Partners in Flight (MTPIF) Bird Conservation Plan (Young 2000) as "Priority Level II" for conservation needs in Montana: Bald Eagle, Killdeer, Long-billed Curlew, Greater Yellowlegs, Spotted Sandpiper, Long-billed Dowitcher, Wilson's Phalarope, Red-necked Phalarope, Red-naped Sapsucker, Willow Flycatcher, and Lazuli Bunting. Priority Level II indicates that Montana land managers have a "high responsibility" to monitor the status of and/or design "conservation actions" for those species. The following species that are designated as "Priority Level III" were detected during the inventory: Northern Harrier, Swainson's Hawk, Killdeer, Wilson's Phalarope, Red-necked Phalarope, Downy Woodpecker, Least Flycatcher, Gray Catbird, Cassin's Vireo, Warbling Vireo, MacGillivray's Warbler, Clay-colored Sparrow, Song Sparrow, Bobolink, Red-winged Blackbird, Yellow-headed Blackbird, Brewer's Blackbird, and Cassin's Finch. Priority Level III identifies species that can be considered indicators of "preferred habitat," and the presence of these species may serve as "added criteria in the design and selection of conservation or monitoring strategies." In order to provide NPS with management suggestions, we reviewed the MTPIF Bird Conservation Plan and provide summaries for these species.

Careful monitoring of bird populations is a vital part of identifying changes that could signal trouble for bird species. An advantage of having used distance sampling for this inventory is that the inventory can evolve into a monitoring program if funding is arranged to conduct transects and point counts in future years. In this report we provide detailed directions that will allow for the point count transects to be repeated in future years.

Introduction

As part of the NPS Natural Resource Challenge (1999), The Rocky Mountain Inventory and Monitoring Network has identified avian inventory needs at several parks and monuments, including Grant-Kohrs Ranch National Historic Site in western Montana. A review of records by park personnel indicated that an extensive survey of existing avifauna of GRKO had not been completed. Species presence/absence had not been adequately determined for some species in all habitats. Lack of such baseline information potentially limits the National Park Service's ability to develop adequate management guidelines for avian species and their habitats or to adequately protect those species. As part of a new service-wide emphasis on inventory and monitoring, in 2001 the National Park Service entered into task agreement (Cooperative Agreement RMBO-1200-99-006, Task Agreements RMBO-11 and RMBO-14) with the Rocky Mountain Bird Observatory (RMBO) to conduct an avian inventory of GRKO. The inventory was a component of a suite of biological inventories being conducted within the Rocky Mountain Network (ROMN). The objectives of the inventory were to:

- 1) Document through existing, verifiable data and field investigations the occurrence of at least 90 percent of the bird species currently estimated to occur in GRKO;
- 2) Using systematic surveys, document presence/absence of bird species, and their distribution and qualitative abundance in habitats that were historically under-sampled or not sampled;
- 3) Identify locations of critical breeding and non-breeding habitats where current records are lacking;
- 4) Document presence/absence of birds of special management concern that are known or expected to occur in GRKO based on habitat or historic records;
- 5) Based on the inventory, recommend an effective monitoring program so that Resource Management staff at each park can assess the condition of bird populations over time and detect significant changes in those populations; and
- 6) Summarize bird information in appropriate formats to contribute to the population of National Park Service databases.

RMBO staff began work during the spring of 2004, and completed the project during the winter of 2005. This report presents the results of their efforts.

Methods

The inventory consisted of surveys of breeding (spring and summer), migratory (spring and fall), and wintering birds. To inventory breeding birds, we established a habitat-stratified point-count transect in each of the two major habitats of GRKO (Grassland and Riparian). We used distance sampling methodology (Buckland et al. 1993, Leukering et al. 2001) to derive estimates of breeding bird densities.

Grassland (GR) - We designated habitat dominated by various grass species and without a significant component of trees or shrubs as Grassland. Field biologists conducted one transect of 14 point counts in grassland.

Riparian (RP) – We designated habitat along the Clark Fork River as Riparian. The dominant vegetation was Cottonwood (*Populus* sp.), Willow (*Salix* sp.), Alder (*Alnus* sp.), and River Birch (*Betula nigra*). Field biologists conducted one transect of 20 point counts in Riparian habitat.

We selected the transect locations that allowed all of the available natural (non-agricultural) habitats available at GRKO to be surveyed. Field biologists ran transects along pre-determined bearings (the structure of the habitat dictated the bearings) and conducted point counts every 250 meters. During point counts, field biologists recorded every individual bird heard or seen during a five-minute period, and used laser rangefinders to determine distances to the birds. For a more detailed description of field protocol, see Appendix F.

To inventory wintering, migratory, and nocturnal birds, field biologists conducted informal bird surveys throughout the park, attempting to cover the entire area thoroughly. During the informal counts, observers did not record distances to the birds; the erratic movement of most wintering and migratory birds, and their tendency to flock makes distance sampling impractical (see Buckland et al. 2001). During nocturnal surveys, field biologists played pre-recorded tapes of expected nocturnal species for that area to elicit responses. Following the playing of a species' call, observers listened for three minutes for responses.

We used Program DISTANCE to determine density estimates for species with sample sizes > 19 individual detections. In this report, all references to density estimates are values provided by DISTANCE, and are denoted as "D." The notation, concepts, and analysis methods of the program were developed by Buckland et al. (1993, 2001). The program can analyze several forms of distance-sampling data, fitting a detection curve to the data set to be analyzed. The program limits some serious biases inherent in traditional analysis of point-count data (e.g., variable detectability among species, habitats, or years), but comes with three assumptions: 1) all birds at distance 0 are detected; 2) distances of birds close to the point are measured accurately; and 3) birds do not move in response to the observer's presence. We should note that we chose a minimum of 20 individuals for analyses in order to include more species in the final analyses. However, 20 individuals may not be a sufficient sample size for statistically significant results, as a low sample size typically results in a large confidence interval and coefficient of variation (Buckland et al. 1993). In this report, densities of species with low sample sizes should be treated with caution, and confidence intervals should be studied closely.

To supplement field investigations, we reviewed *Montana Bird Distribution* (Lenard et al. 2003) to determine which species had been previously documented in the GRKO area. This publication is currently the definitive reference for the distribution of Montana's birds. We also reviewed the current GRKO bird checklist (NPSpecies database).

Since the bulk of the fieldwork focused on breeding bird species, and distance sampling protocol allowed us to obtain densities of only breeding bird species, references in the

“Results” section below refer only to breeding bird point counts. Results of winter, migratory, and nocturnal surveys are reflected in the GRKO bird checklist (Appendix C).

Results

During the point-count transects, field biologists detected a total (in both habitats combined) of 577 individual birds of 54 species (Table 1). Species for which they obtained sample sizes sufficient to calculate density in individual habitats (≥ 19 individuals) included Willow Flycatcher (n=21, Riparian), European Starling (n=20, Riparian), Yellow Warbler (n=25, Riparian), Vesper Sparrow (n=28, Grassland), Savannah Sparrow (n=76, Grassland and Riparian), Red-winged Blackbird (n=22, Riparian), Western Meadowlark (n=50, Grassland and Riparian), and Brown-headed Cowbird (n=31, Riparian) (Table 2). They detected four individual raptors of three species: Osprey (n=1), Red-tailed Hawk (n=1), and American Kestrel (n=2) (Table 2). Species that they detected in low numbers (n=1) included Canada Goose, Gadwall, Mallard, Ruddy Duck, Osprey, Red-tailed Hawk, Sora, Downy Woodpecker, Least Flycatcher, Western Kingbird, Tree Swallow, Cliff Swallow, Cedar Waxwing, and Clay-colored Sparrow (Table 2).

Grassland – Field biologists detected 145 individual birds of 19 species in Grassland habitat (Table 1) and obtained sufficient sample size to calculate density estimates for three species, Savannah Sparrow (D = 1.32 birds per hectare), Vesper Sparrow (D = 0.61 birds per hectare), and Western Meadowlark (D = 0.35 birds per hectare)(Table 3).

Riparian – Field biologists detected 412 individual birds of 49 species in Riparian habitat (Table 1) and obtained sufficient sample size to calculate density estimates for seven species: Willow Flycatcher (D = 0.72 birds per hectare), European Starling (D = 3.62 birds per hectare), Yellow Warbler (D = 1.50 birds per hectare), Savannah Sparrow (D = 4.69 birds per hectare), Red-winged Blackbird (D = 0.82 birds per hectare), Western Meadowlark (D = 0.24 birds per hectare), and Brown-headed Cowbird (D = 1.76 birds per hectare)(Table 3).

We revised the GRKO bird checklist to include 230 species (Appendix C). In addition to the 104 species that were detected by field biologists during the inventory, 189 are documented in *Montana Bird Distribution* (Lenard et al. 2003), and 129 were in the NPSpecies database.

Table 1. Number of point counts in each habitat with totals of species and individuals detected in Grant-Kohrs Ranch National Historic Site, Summer 2004.

Habitat	# point counts	# species	# individuals
Grassland	14	19	145
Riparian	20	49	412
All	34	54	557

Table 2. Numbers of birds detected in each habitat on point counts at Grant-Kohrs Ranch National Historic Site, Summer 2004. Species in Bold are listed by MTPIF as priorities for management.

Species	Grassland	Riparian	Total
Canada Goose	0	1	1
Wood Duck	0	4	4
Gadwall	0	1	1
Mallard	0	1	1
Ruddy Duck	0	1	1
Osprey	0	1	1
Red-tailed Hawk	0	1	1
American Kestrel	1	1	2
Sora	0	1	1
Killdeer	3	8	11
Spotted Sandpiper	0	8	8
Long-billed Curlew	7	0	7
Wilson's Snipe	0	14	14
Mourning Dove	2	9	11
Red-naped Sapsucker	0	2	2
Downy Woodpecker	0	1	1
Northern Flicker	0	7	7
Western Wood-Pewee	0	3	3
Willow Flycatcher	1	20	21
Least Flycatcher	0	1	1
Western Kingbird	0	1	1
Eastern Kingbird	0	5	5
Black-billed Magpie	0	18	18
American Crow	3	16	19
Common Raven	2	0	2
Horned Lark	19	0	19
Tree Swallow	0	1	1
Northern Rough-winged Swallow	4	1	5
Bank Swallow	0	7	7
Cliff Swallow	1	0	1
Black-capped Chickadee	0	2	2
House Wren	0	10	10
Marsh Wren	0	11	11
American Robin	0	4	4
Gray Catbird	0	10	10
European Starling	0	20	20
Cedar Waxwing	0	1	1
Yellow Warbler	0	25	25
Northern Waterthrush	0	6	6
Common Yellowthroat	1	14	15
Clay-colored Sparrow	0	1	1
Vesper Sparrow	27	1	28
Savannah Sparrow	30	46	76
Song Sparrow	0	18	18
Black-headed Grosbeak	0	3	3
Bobolink	3	8	11
Red-winged Blackbird	1	22	23

Table 2. Continued.

Species	Grassland	Riparian	Total
Western Meadowlark	29	21	50
Yellow-headed Blackbird	0	10	10
Brewer's Blackbird	9	0	9
Common Grackle	1	8	9
Brown-headed Cowbird	1	31	32
Bullock's Oriole	0	4	4
American Goldfinch	0	2	2

Table 3. Results of DISTANCE analysis for species with sample sizes ≥ 19 in individual habitats at Grant-Kohrs Ranch National Historic Site. N=untruncated sample size; D=density estimate, expressed as individuals per hectare (from program DISTANCE); CI=95% confidence intervals of density estimate; CV(%)=percent coefficient of variation of the density estimate.

Species	Habitat	n	D	CI	CV(%)
Willow Flycatcher	Riparian	21	0.718	0.323-1.598	39.7
European Starling	Riparian	20	3.622	0.955-13.740	69.5
Yellow Warbler	Riparian	25	1.498	0.969-2.317	21.4
Vesper Sparrow	Grassland	27	0.606	0.354-1.037	26.7
Savannah Sparrow	Grassland	30	1.321	0.652-2.679	35.6
Savannah Sparrow	Riparian	46	4.691	3.298-6.672	17.6
Red-winged Blackbird	Riparian	22	0.820	0.411-1.635	34.1
Western Meadowlark	Grassland	29	0.347	0.219-0.549	22.8
Western Meadowlark	Riparian	21	0.240	0.123-0.469	32.8
Brown-headed Cowbird	Riparian	31	1.757	1.093-2.824	23.6

Table 4. Results of DISTANCE analysis for all species combined among both habitats in Grant-Kohrs Ranch National Historic Site. n=sample size; D=density estimate, individuals per hectare (from program DISTANCE); CI=95% confidence intervals of density estimate; CV(%)=percent coefficient of variation of the density estimate.

Habitat	n	D	CI	CV(%)
Grassland	134	3.636	2.763-4.785	14.0
Riparian	392	21.474	18.596-24.798	7.3

Discussion

Documentation of 90 percent of the bird species currently expected to occur in GRKO

Of the 230 species on the revised checklist of Grant-Kohrs Ranch National Historic Site birds (Appendix C), 143 species are listed as “Present in Park” and 87 are listed as “Probably Present”. Species listed as “Present in Park” account for 62% of the total list.

Because of the unpredictable behavior of migratory birds, their presence in any area can be erratic. Many migratory species expected to occur in GRKO (listed as “Probably Present” on the GRKO bird checklist) were included based on their occurrences in neighboring areas (documented in *Montana Bird Distribution*) (Lenard et al. 2003).

Occurrences of species listed as “Probably Present” in GRKO are hypothetical and do not indicate that the species will actually occur. Documentation of migratory species is an ongoing process, and it may take many years to confirm some of these species. Some of them may never be confirmed, and some species that have occurred in the park historically may never occur there again (many species wander far from their normal migratory ranges). The confirmation of these species will, therefore, be dependent upon park personnel and visitors submitting Natural History Field Observation Cards. We recommend that GRKO personnel familiarize themselves with the checklist and submit cards for sightings of species listed as “Probably Present”. We also recommend posting a list of these species at interpretive sites with an explanation of the importance of documenting the species. Many skilled birders visit GRKO, and they are valuable assets. Photographs of the birds should accompany field observation cards; however, since photographing birds is often difficult, all cards should include at least detailed descriptions of the birds’ identification marks, behaviors, and anything else that may aid in their identification.

Documentation of the distribution and abundance of the bird species

Appendix B is a list of the points showing the locations of detections of species listed by Montana Partners In Flight as being “priorities for conservation needs” within GRKO. This list shows only those species detected during the point-count transects. It should be noted that the list should not be interpreted as the overall distribution of the species, as many species are sure to occur in areas that field biologists did not survey, or were present but not detected in areas that were surveyed.

Identification of locations of critical breeding and non-breeding bird habitats

In GRKO, Riparian habitat had the highest overall bird density ($D=21.474$ birds per hectare) of both habitats (Table 4). Bird density was lowest in Grassland habitat ($D=3.636$)(Table 4). This is not surprising, as Riparian areas typically provide important nesting, wintering, and migratory habitat for a large suite of species. Although bird density in Grassland habitat was lower than that in Riparian habitat, grasslands are also important to birds year-round. The populations of several species of Grassland birds have been declining due to loss of habitat (Young 2000), so this habitat should be monitored closely. We should note that one year’s worth of data is not sufficient to determine the health of an ecosystem, and these results should be treated with caution.

Documentation of the presence/absence of birds of special management concern

The Montana Partners in Flight (MTPIF) Bird Conservation Plan (Young 2000) lists the following 27 species, which were detected at GRKO during our surveys, as “Priority Level II” or “Priority Level III” for conservation needs in Montana: Bald Eagle, Northern Harrier, Swainson’s Hawk, Killdeer, Greater Yellowlegs, Spotted Sandpiper, Long-billed Curlew, Long-billed Dowitcher, Wilson’s Snipe, Wilson’s Phalarope, Red-necked Phalarope, Red-naped Sapsucker, Downy Woodpecker, Willow Flycatcher, Least Flycatcher, Cassin’s Vireo, Warbling Vireo, Gray Catbird, MacGillivray’s Warbler,

Clay-colored Sparrow, Song Sparrow, Lazuli Bunting, Bobolink, Red-winged Blackbird, Yellow-headed Blackbird, Brewer's Blackbird, and Cassin's Finch. In order to provide GRKO with management suggestions, we reviewed the MTPIF Bird Conservation Plan and provide summaries for these species in Appendix D. The revised checklist (Appendix C) labels all "Level I", "Level II", and "Level III" species that have been documented at GRKO or in the area.

Recommendation of an effective monitoring program – Careful monitoring of bird populations is a vital part of identifying changes that could signal trouble for species. Although several monitoring methods are available, distance sampling has been used for more than 30 years to estimate population densities of animals and is, in most situations, considered the best method for determining relative population densities or trends for most bird species (Buckland et al. 1993, Fancy and Sauer 2000). For a detailed history and description of distance sampling and its use in the National Parks, see Fancy and Sauer (2000). An advantage of having used distance sampling for this inventory is that the inventory can evolve into a monitoring program if funding is arranged to conduct transects and point counts in future years. Appendix A lists UTM coordinates where point counts took place in 2004 so that point counts can be repeated in future years.

Summarization of bird information in the National Park Service databases – All of the data (raw and electronic) collected during this inventory are on file at the National Park Service – Rocky Mountain Network.

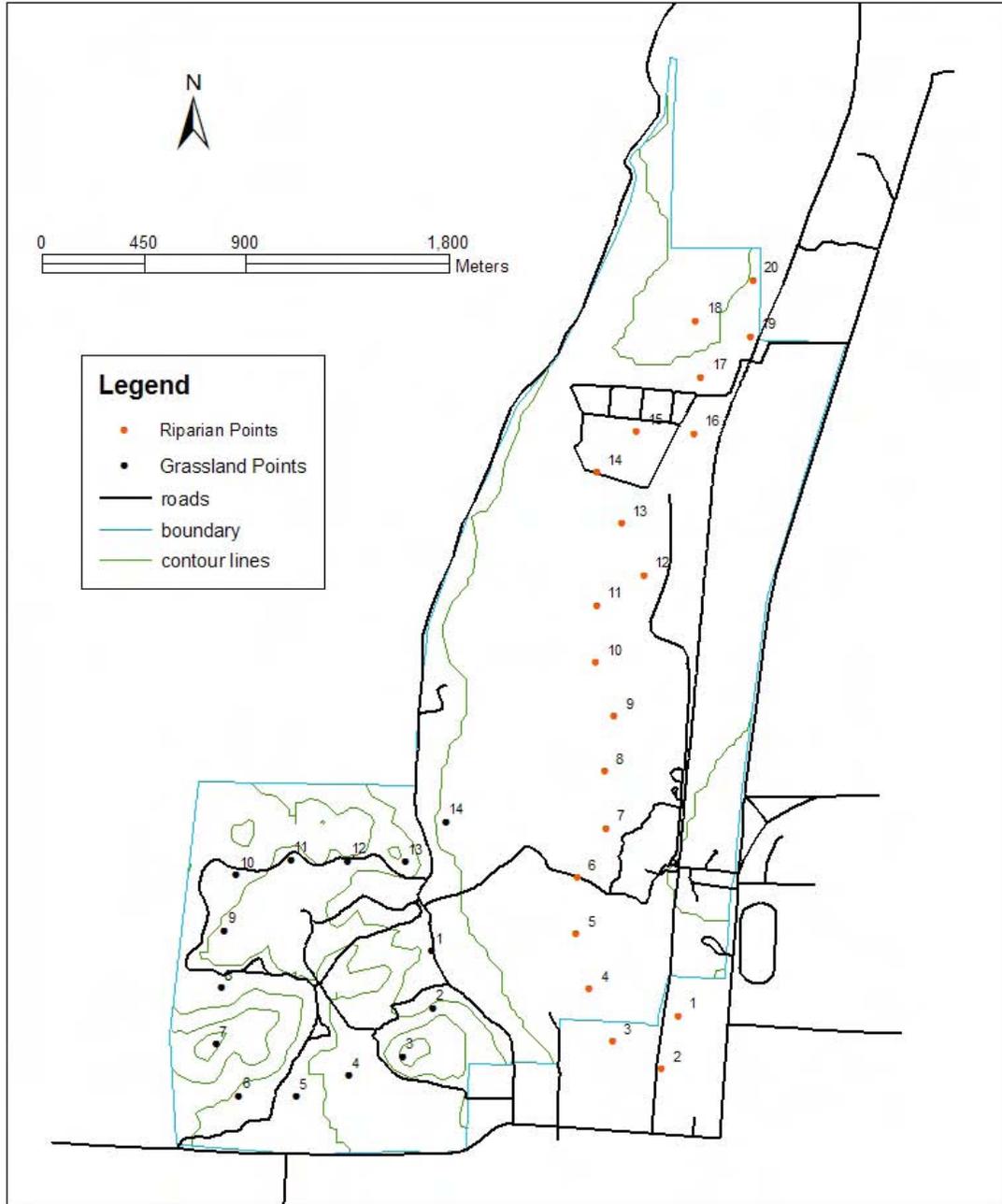
Acknowledgments

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Appendix A. Map of point count locations in Grant-Kohrs Ranch National Historic Site and a list of UTM coordinates for each habitat.



Appendix A. Continued.

Habitat	Point #	Zone	Easting	Northing	Elevation (in feet)
Grassland	1	12T	365330	5140548	4544
Grassland	2	12T	365332	5140296	4564
Grassland	3	12T	365199	5140083	4588
Grassland	4	12T	364961	5139998	4637
Grassland	5	12T	364729	5139904	4673
Grassland	6	12T	364478	5139908	4725
Grassland	7	12T	364375	5140136	4670
Grassland	8	12T	364400	5140386	4645
Grassland	9	12T	364413	5140637	4659
Grassland	10	12T	364466	5140884	4665
Grassland	11	12T	364707	5140951	4654
Grassland	12	12T	364957	5140946	4648
Grassland	13	12T	365210	5140943	4594
Grassland	14	12T	365389	5141119	4553
Riparian	1	12T	366415	5140263	4488
Riparian	2	12T	366342	5140027	4507
Riparian	3	12T	366125	5140150	4507
Riparian	4	12T	366025	5140380	4515
Riparian	5	12T	365967	5140623	4518
Riparian	6	12T	365970	5140874	4515
Riparian	7	12T	366098	5141091	4517
Riparian	8	12T	366091	5141341	4507
Riparian	9	12T	366134	5141587	4512
Riparian	10	12T	366054	5141824	4509
Riparian	11	12T	366056	5142074	4506
Riparian	12	12T	366266	5142208	4506
Riparian	13	12T	366165	5142437	4506
Riparian	14	12T	366055	5142662	4504
Riparian	15	12T	366232	5142842	4511
Riparian	16	12T	366484	5142835	4500
Riparian	17	12T	366516	5143083	4488
Riparian	18	12T	366494	5143333	4485
Riparian	19	12T	366735	5143262	4500
Riparian	20	12T	366747	5143512	4482

*the datum for these UTM coordinates is NAD 27.

Appendix B. List of points counts on which bird species listed by Montana Partners in Flight as “Priority for conservation needs” that were detected at Grant-Kohrs Ranch National Historic Site.

Species	Habitat	Point	number of birds
Killdeer	riparian	4	1
Killdeer	riparian	7	1
Killdeer	riparian	13	1
Killdeer	riparian	15	1
Killdeer	riparian	17	2
Killdeer	riparian	19	2
Killdeer	grassland	6	1
Killdeer	grassland	14	2
Spotted Sandpiper	riparian	4	2
Spotted Sandpiper	riparian	5	1
Spotted Sandpiper	riparian	8	1
Spotted Sandpiper	riparian	11	1
Spotted Sandpiper	riparian	15	1
Spotted Sandpiper	riparian	17	1
Spotted Sandpiper	riparian	19	1
Long-billed Curlew	grassland	7	1
Long-billed Curlew	grassland	10	5
Long-billed Curlew	grassland	14	1
Red-naped Sapsucker	riparian	2	1
Red-naped Sapsucker	riparian	18	1
Downy Woodpecker	riparian	17	1
Willow Flycatcher	riparian	2	1
Willow Flycatcher	riparian	3	1
Willow Flycatcher	riparian	5	2
Willow Flycatcher	riparian	6	2
Willow Flycatcher	riparian	10	1
Willow Flycatcher	riparian	12	2
Willow Flycatcher	riparian	13	1
Willow Flycatcher	riparian	14	1
Willow Flycatcher	riparian	15	2
Willow Flycatcher	riparian	16	1
Willow Flycatcher	riparian	17	1
Willow Flycatcher	riparian	18	1
Willow Flycatcher	riparian	19	2
Willow Flycatcher	riparian	20	2
Willow Flycatcher	grassland	6	1
Least Flycatcher	riparian	2	1
Gray Catbird	riparian	10	1
Gray Catbird	riparian	12	1
Gray Catbird	riparian	16	2
Gray Catbird	riparian	17	1
Gray Catbird	riparian	18	2
Gray Catbird	riparian	19	1
Gray Catbird	riparian	20	2
Clay-colored Sparrow	riparian	14	1
Song Sparrow	riparian	3	1

Appendix B. Continued.

Species	Habitat	Point	number of birds
Song Sparrow	riparian	4	1
Song Sparrow	riparian	5	3
Song Sparrow	riparian	6	1
Song Sparrow	riparian	10	2
Song Sparrow	riparian	11	1
Song Sparrow	riparian	12	1
Song Sparrow	riparian	13	1
Song Sparrow	riparian	15	1
Song Sparrow	riparian	16	2
Song Sparrow	riparian	17	1
Song Sparrow	riparian	18	1
Song Sparrow	riparian	19	1
Song Sparrow	riparian	20	1
Red-winged Blackbird	riparian	1	2
Red-winged Blackbird	riparian	12	2
Red-winged Blackbird	riparian	13	8
Red-winged Blackbird	riparian	14	2
Red-winged Blackbird	riparian	17	2
Red-winged Blackbird	riparian	18	1
Red-winged Blackbird	riparian	20	5
Red-winged Blackbird	grassland	6	1
Yellow-headed Blackbird	riparian	13	4
Yellow-headed Blackbird	riparian	14	5
Yellow-headed Blackbird	riparian	15	1
Brewer's Blackbird	grassland	1	1
Brewer's Blackbird	grassland	4	2
Brewer's Blackbird	grassland	5	1
Brewer's Blackbird	grassland	11	1
Brewer's Blackbird	grassland	13	2
Brewer's Blackbird	grassland	14	2

Appendix C. Revised Grant-Kohrs Ranch National Historic Site bird checklist.

Order	Family	Standard Scientific Name	Common Name	TSN	Park Status	Abundance	Residency
Anseriformes	Anatidae	<i>Anser albifrons</i>	Greater White-fronted Goose	175020	Probably Present	N/A	N/A
Anseriformes	Anatidae	<i>Chen caerulescens</i>	Snow Goose	175038	Present in Park	Common	Migratory
Anseriformes	Anatidae	<i>Chen rossii</i>	Ross's Goose	175041	Probably Present	N/A	N/A
Anseriformes	Anatidae	<i>Branta canadensis</i>	Canada Goose	174999	Present in Park	Common	Breeder
Anseriformes	Anatidae	<i>Cygnus buccinator</i>	Trumpeter Swan	174992	Probably Present	N/A	N/A
Anseriformes	Anatidae	<i>Cygnus columbianus</i>	Tundra Swan	174987	Probably Present	N/A	N/A
Anseriformes	Anatidae	<i>Aix sponsa</i>	Wood Duck	175122	Present in Park	Uncommon	Breeder
Anseriformes	Anatidae	<i>Anas strepera</i>	Gadwall	175073	Present in Park	Common	Breeder
Anseriformes	Anatidae	<i>Anas americana</i>	American Wigeon	175094	Present in Park	Common	Breeder
Anseriformes	Anatidae	<i>Anas platyrhynchos</i>	Mallard	175063	Present in Park	Common	Resident
Anseriformes	Anatidae	<i>Anas discors</i>	Blue-winged Teal	175086	Present in Park	Unknown	Unknown
Anseriformes	Anatidae	<i>Anas cyanoptera</i>	Cinnamon Teal	175089	Present in Park	Common	Breeder
Anseriformes	Anatidae	<i>Anas clypeata</i>	Northern Shoveler	175096	Present in Park	Common	Breeder
Anseriformes	Anatidae	<i>Anas acuta</i>	Northern Pintail	175074	Present in Park	Common	Breeder
Anseriformes	Anatidae	<i>Anas crecca</i>	Green-winged Teal	175081	Present in Park	Common	Breeder
Anseriformes	Anatidae	<i>Aythya valisineria</i>	Canvasback	175129	Present in Park	Common	Unknown
Anseriformes	Anatidae	<i>Aythya americana</i>	Redhead	175125	Present in Park	Common	Breeder
Anseriformes	Anatidae	<i>Aythya collaris</i>	Ring-necked Duck	175128	Present in Park	Common	Breeder
Anseriformes	Anatidae	<i>Aythya marila</i>	Greater Scaup	175130	Probably Present	N/A	N/A
Anseriformes	Anatidae	<i>Aythya affinis</i>	Lesser Scaup	175134	Present in Park	Common	Resident
Anseriformes	Anatidae	<i>Histrionicus histrionicus</i>	Harlequin Duck	175149	Probably Present	N/A	N/A
Anseriformes	Anatidae	<i>Clangula hyemalis</i>	Long-tailed Duck	175147	Probably Present	N/A	N/A
Anseriformes	Anatidae	<i>Bucephala albeola</i>	Bufflehead	175145	Present in Park	Common	Breeder
Anseriformes	Anatidae	<i>Bucephala clangula</i>	Common Goldeneye	175141	Present in Park	Common	Unknown
Anseriformes	Anatidae	<i>Bucephala islandica</i>	Barrow's Goldeneye	175144	Present in Park	Common	Unknown
Anseriformes	Anatidae	<i>Lophodytes cucullatus</i>	Hooded Merganser	175183	Probably Present	N/A	N/A
Anseriformes	Anatidae	<i>Mergus merganser</i>	Common Merganser	175185	Present in Park	Common	Migratory
Anseriformes	Anatidae	<i>Mergus serrator</i>	Red-breasted Merganser	175187	Probably Present	N/A	N/A
Anseriformes	Anatidae	<i>Oxyura jamaicensis</i>	Ruddy Duck	175175	Present in Park	Common	Breeder
Galliformes	Phasianidae	<i>Perdix perdix</i>	Gray Partridge	175915	Present in Park	Unknown	Migratory
Galliformes	Phasianidae	<i>Phasianus colchicus</i>	Ring-necked Pheasant	175905	Probably Present	N/A	N/A

Appendix C. Continued.

Order	Family	Standard Scientific Name	Common Name	TSN	Park Status	Abundance	Residency
Galliformes	Phasianidae	<i>Meleagris gallopavo</i>	Wild Turkey	176136	Probably Present	N/A	N/A
Ciconiiformes	Gaviidae	<i>Gavia immer</i>	Common Loon	174469	Present in Park	Uncommon	Migratory
Ciconiiformes	Podicipedidae	<i>Podilymbus podiceps</i>	Pied-billed Grebe	174505	Probably Present	N/A	N/A
Ciconiiformes	Podicipedidae	<i>Podiceps auritus</i>	Horned Grebe	174482	Present in Park	Uncommon	Migratory
Ciconiiformes	Podicipedidae	<i>Podiceps grisegena</i>	Red-necked Grebe	174479	Probably Present	N/A	N/A
Ciconiiformes	Podicipedidae	<i>Podiceps nigricollis</i>	Eared Grebe	174485	Present in Park	Common	Breeder
Ciconiiformes	Podicipedidae	<i>Aechmophorus occidentalis</i>	Western Grebe	174503	Present in Park	Uncommon	Migratory
Ciconiiformes	Pelecanidae	<i>Pelecanus erythrorhynchos</i>	American White Pelican	174684	Probably Present	N/A	N/A
Ciconiiformes	Phalacrocoracidae	<i>Phalacrocorax auritus</i>	Double-crested Cormorant	174717	Present in Park	Uncommon	Vagrant
Ciconiiformes	Ardeidae	<i>Botaurus lentiginosus</i>	American Bittern	174856	Probably Present	N/A	N/A
Ciconiiformes	Ardeidae	<i>Ardea herodias</i>	Great Blue Heron	174773	Present in Park	Common	Breeder
Ciconiiformes	Ardeidae	<i>Casmerodius albus</i>	Great Egret	174810	Present in Park	Rare	Migratory
Ciconiiformes	Ardeidae	<i>Egretta thula</i>	Snowy Egret	174813	Probably Present	N/A	N/A
Ciconiiformes	Ardeidae	<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron	174832	Probably Present	N/A	N/A
Ciconiiformes	Threskiornithidae	<i>Plegadis chihi</i>	White-faced Ibis	174926	Probably Present	N/A	N/A
Ciconiiformes	Ciconiidae	<i>Cathartes aura</i>	Turkey Vulture	175265	Probably Present	N/A	N/A
Ciconiiformes	Accipitridae	<i>Pandion haliaetus</i>	Osprey	175590	Present in Park	Uncommon	Breeder
Ciconiiformes	Accipitridae	<i>Haliaeetus leucocephalus</i>	Bald Eagle	175420	Present in Park	Common	Resident
Ciconiiformes	Accipitridae	<i>Circus cyaneus</i>	Northern Harrier	175430	Present in Park	Common	Resident
Ciconiiformes	Accipitridae	<i>Accipiter striatus</i>	Sharp-shinned Hawk	175304	Probably Present	N/A	N/A
Ciconiiformes	Accipitridae	<i>Accipiter cooperii</i>	Cooper's Hawk	175309	Present in Park	Unknown	Unknown
Ciconiiformes	Accipitridae	<i>Accipiter gentilis</i>	Northern Goshawk	175300	Probably Present	N/A	N/A
Ciconiiformes	Accipitridae	<i>Buteo swainsoni</i>	Swainson's Hawk	175367	Present in Park	Uncommon	Breeder
Ciconiiformes	Accipitridae	<i>Buteo jamaicensis</i>	Red-tailed Hawk	175350	Present in Park	Common	Breeder
Ciconiiformes	Accipitridae	<i>Buteo regalis</i>	Ferruginous Hawk	175377	Probably Present	N/A	N/A
Ciconiiformes	Accipitridae	<i>Buteo lagopus</i>	Rough-legged Hawk	175373	Present in Park	Common	Breeder
Ciconiiformes	Accipitridae	<i>Aquila chrysaetos</i>	Golden Eagle	175407	Present in Park	Common	Resident
Ciconiiformes	Falconidae	<i>Falco sparverius</i>	American Kestrel	175622	Present in Park	Common	Breeder
Ciconiiformes	Falconidae	<i>Falco columbarius</i>	Merlin	175613	Probably Present	N/A	N/A
Ciconiiformes	Falconidae	<i>Falco rusticolus</i>	Gyr Falcon	175599	Present in Park	Rare	Migratory
Ciconiiformes	Falconidae	<i>Falco peregrinus</i>	Peregrine Falcon	175604	Probably Present	N/A	N/A

Appendix C. Continued.

Order	Family	Standard Scientific Name	Common Name	TSN	Park Status	Abundance	Residency
Ciconiiformes	Falconidae	<i>Falco mexicanus</i>	Prairie Falcon	175603	Present in Park	Common	Unknown
Gruiformes	Rallidae	<i>Rallus limicola</i>	Virginia Rail	176221	Probably Present	N/A	N/A
Gruiformes	Rallidae	<i>Porzana carolina</i>	Sora	176242	Present in Park	Uncommon	Breeder
Gruiformes	Rallidae	<i>Fulica americana</i>	American Coot	176292	Present in Park	Common	Unknown
Gruiformes	Gruidae	<i>Grus canadensis</i>	Sandhill Crane	176177	Present in Park	Common	Breeder
Ciconiiformes	Charadriidae	<i>Pluvialis squatarola</i>	Black-bellied Plover	176567	Probably Present	N/A	N/A
Ciconiiformes	Charadriidae	<i>Charadrius semipalmatus</i>	Semipalmated Plover	176506	Probably Present	N/A	N/A
Ciconiiformes	Charadriidae	<i>Charadrius vociferus</i>	Killdeer	176520	Present in Park	Common	Breeder
Ciconiiformes	Charadriidae	<i>Himantopus mexicanus</i>	Black-necked Stilt	176726	Probably Present	N/A	N/A
Ciconiiformes	Charadriidae	<i>Recurvirostra americana</i>	American Avocet	176721	Probably Present	N/A	N/A
Ciconiiformes	Scolopacidae	<i>Tringa melanoleuca</i>	Greater Yellowlegs	176619	Present in Park	Unknown	Unknown
Ciconiiformes	Scolopacidae	<i>Tringa flavipes</i>	Lesser Yellowlegs	176620	Probably Present	N/A	N/A
Ciconiiformes	Scolopacidae	<i>Tringa solitaria</i>	Solitary Sandpiper	176615	Present in Park	Common	Unknown
Ciconiiformes	Scolopacidae	<i>Catoptrophorus semipalmatus</i>	Willet	176638	Probably Present	N/A	N/A
Ciconiiformes	Scolopacidae	<i>Actitis macularia</i>	Spotted Sandpiper	176612	Present in Park	Common	Breeder
Ciconiiformes	Scolopacidae	<i>Numenius phaeopus</i>	Whimbrel	176599	Probably Present	N/A	N/A
Ciconiiformes	Scolopacidae	<i>Numenius americanus</i>	Long-billed Curlew	176593	Present in Park	Common	Breeder
Ciconiiformes	Scolopacidae	<i>Limosa fedoa</i>	Marbled Godwit	176686	Present in Park	Rare	Migratory
Ciconiiformes	Scolopacidae	<i>Calidris alba</i>	Sanderling	176669	Probably Present	N/A	N/A
Ciconiiformes	Scolopacidae	<i>Calidris pusilla</i>	Semipalmated Sandpiper	176667	Probably Present	N/A	N/A
Ciconiiformes	Scolopacidae	<i>Calidris mauri</i>	Western Sandpiper	176668	Probably Present	N/A	N/A
Ciconiiformes	Scolopacidae	<i>Calidris minutilla</i>	Least Sandpiper	176656	Probably Present	N/A	N/A
Ciconiiformes	Scolopacidae	<i>Calidris bairdii</i>	Baird's Sandpiper	176655	Present in Park	Uncommon	Migratory
Ciconiiformes	Scolopacidae	<i>Calidris melanotos</i>	Pectoral Sandpiper	176653	Probably Present	N/A	N/A
Ciconiiformes	Scolopacidae	<i>Calidris himantopus</i>	Stilt Sandpiper	554145	Probably Present	N/A	N/A
Ciconiiformes	Scolopacidae	<i>Limnodromus scolopaceus</i>	Long-billed Dowitcher	176679	Present in Park	Unknown	Unknown
Ciconiiformes	Scolopacidae	<i>Gallinago delicata</i>	Wilson's Snipe	176700	Present in Park	Common	Breeder
Ciconiiformes	Scolopacidae	<i>Phalaropus tricolor</i>	Wilson's Phalarope	176736	Present in Park	Common	Breeder
Ciconiiformes	Scolopacidae	<i>Phalaropus lobatus</i>	Red-necked Phalarope	176735	Present in Park	Uncommon	Migratory
Ciconiiformes	Laridae	<i>Larus pipixcan</i>	Franklin's Gull	176838	Probably Present	N/A	N/A
Ciconiiformes	Laridae	<i>Larus philadelphia</i>	Bonaparte's Gull	176839	Probably Present	N/A	N/A

Appendix C. Continued.

Order	Family	Standard Scientific Name	Common Name	TSN	Park Status	Abundance	Residency
Ciconiiformes	Laridae	<i>Larus delawarensis</i>	Ring-billed Gull	176830	Present in Park	Common	Migratory
Ciconiiformes	Laridae	<i>Larus californicus</i>	California Gull	176829	Probably Present	N/A	N/A
Ciconiiformes	Laridae	<i>Larus argentatus</i>	Herring Gull	176824	Probably Present	N/A	N/A
Ciconiiformes	Laridae	<i>Xema sabini</i>	Sabine's Gull	176866	Probably Present	N/A	N/A
Ciconiiformes	Laridae	<i>Sterna caspia</i>	Caspian Tern	176924	Probably Present	N/A	N/A
Ciconiiformes	Laridae	<i>Sterna hirundo</i>	Common Tern	176888	Probably Present	N/A	N/A
Ciconiiformes	Laridae	<i>Chlidonias niger</i>	Black Tern	176959	Probably Present	N/A	N/A
Columbiformes	Columbidae	<i>Columba livia</i>	Rock Pigeon	177071	Present in Park	Common	Resident
Columbiformes	Columbidae	<i>Patagioenas fasciata</i>	Band-tailed Pigeon	177065	Present in Park	Rare	Migratory
Columbiformes	Columbidae	<i>Zenaida macroura</i>	Mourning Dove	177125	Present in Park	Common	Breeder
Cuculiformes	Coccyzidae	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	177834	Probably Present	N/A	N/A
Strigiformes	Strigidae	<i>Bubo virginianus</i>	Great Horned Owl	177884	Present in Park	Common	Resident
Strigiformes	Strigidae	<i>Glaucidium gnoma</i>	Northern Pygmy-Owl	177902	Probably Present	N/A	N/A
Strigiformes	Strigidae	<i>Athene cunicularia</i>	Burrowing Owl	177946	Probably Present	N/A	N/A
Strigiformes	Strigidae	<i>Asio otus</i>	Long-eared Owl	177932	Probably Present	N/A	N/A
Strigiformes	Strigidae	<i>Asio flammeus</i>	Short-eared Owl	177935	Probably Present	N/A	N/A
Strigiformes	Strigidae	<i>Aegolius acadicus</i>	Northern Saw-whet Owl	177942	Probably Present	N/A	N/A
Strigiformes	Caprimulgidae	<i>Chordeiles minor</i>	Common Nighthawk	177979	Present in Park	Common	Breeder
Apodiformes	Apodidae	<i>Aeronautes saxatalis</i>	White-throated Swift	178014	Probably Present	N/A	N/A
Trochiliformes	Trochilidae	<i>Calypte anna</i>	Anna's Hummingbird	178036	Probably Present	N/A	N/A
Trochiliformes	Trochilidae	<i>Stellula calliope</i>	Calliope Hummingbird	178048	Present in Park	Uncommon	Breeder
Trochiliformes	Trochilidae	<i>Selasphorus rufus</i>	Rufous Hummingbird	178040	Present in Park	Common	Breeder
Coraciiformes	Cerylidae	<i>Ceryle alcyon</i>	Belted Kingfisher	178119	Present in Park	Unknown	Resident
Piciformes	Picidae	<i>Melanerpes lewis</i>	Lewis's Woodpecker	178196	Probably Present	N/A	N/A
Piciformes	Picidae	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	178186	Probably Present	N/A	N/A
Piciformes	Picidae	<i>Sphyrapicus thyroideus</i>	Williamson's Sapsucker	178208	Probably Present	N/A	N/A
Piciformes	Picidae	<i>Sphyrapicus nuchalis</i>	Red-naped Sapsucker	178211	Present in Park	Uncommon	Migratory
Piciformes	Picidae	<i>Picoides pubescens</i>	Downy Woodpecker	178259	Present in Park	Common	Breeder
Piciformes	Picidae	<i>Picoides villosus</i>	Hairy Woodpecker	178262	Present in Park	Common	Migratory
Piciformes	Picidae	<i>Colaptes auratus</i>	Northern Flicker	178154	Present in Park	Common	Breeder
Passeriformes	Tyrannidae	<i>Contopus cooperi</i>	Olive-sided Flycatcher	554221	Probably Present	N/A	N/A

Appendix C. Continued.

Order	Family	Standard Scientific Name	Common Name	TSN	Park Status	Abundance	Residency
Passeriformes	Tyrannidae	<i>Contopus sordidulus</i>	Western Wood-Pewee	178360	Present in Park	Uncommon	Breeder
Passeriformes	Tyrannidae	<i>Empidonax traillii</i>	Willow Flycatcher	178341	Present in Park	Common	Breeder
Passeriformes	Tyrannidae	<i>Empidonax minimus</i>	Least Flycatcher	178344	Present in Park	Uncommon	Breeder
Passeriformes	Tyrannidae	<i>Empidonax hammondii</i>	Hammond's Flycatcher	554254	Probably Present	N/A	N/A
Passeriformes	Tyrannidae	<i>Empidonax oberholseri</i>	Dusky Flycatcher	178346	Present in Park	Uncommon	Migratory
Passeriformes	Tyrannidae	<i>Empidonax occidentalis</i>	Cordilleran Flycatcher	178348	Present in Park	Uncommon	Migratory
Passeriformes	Tyrannidae	<i>Sayornis saya</i>	Say's Phoebe	178333	Probably Present	N/A	N/A
Passeriformes	Tyrannidae	<i>Myiarchus cinerascens</i>	Ash-throated Flycatcher	178316	Probably Present	N/A	N/A
Passeriformes	Tyrannidae	<i>Tyrannus verticalis</i>	Western Kingbird	178287	Present in Park	Uncommon	Breeder
Passeriformes	Tyrannidae	<i>Tyrannus tyrannus</i>	Eastern Kingbird	178279	Present in Park	Common	Resident
Passeriformes	Vireonidae	<i>Vireo cassinii</i>	Cassin's Vireo	554456	Present in Park	Uncommon	Migratory
Passeriformes	Vireonidae	<i>Vireo gilvus</i>	Warbling Vireo	179023	Present in Park	Uncommon	Migratory
Passeriformes	Corvidae	<i>Perisoreus canadensis</i>	Gray Jay	179667	Present in Park	Common	Resident
Passeriformes	Corvidae	<i>Cyanocitta stelleri</i>	Steller's Jay	179685	Probably Present	N/A	N/A
Passeriformes	Corvidae	<i>Cyanocitta cristata</i>	Blue Jay	179680	Probably Present	N/A	N/A
Passeriformes	Corvidae	<i>Gymnorhinus cyanocephalus</i>	Pinyon Jay	179748	Probably Present	N/A	N/A
Passeriformes	Corvidae	<i>Nucifraga columbiana</i>	Clark's Nutcracker	179750	Present in Park	Uncommon	Resident
Passeriformes	Corvidae	<i>Pica hudsonia</i>	Black-billed Magpie	179720	Present in Park	Common	Resident
Passeriformes	Corvidae	<i>Corvus brachyrhynchos</i>	American Crow	179731	Present in Park	Common	Breeder
Passeriformes	Corvidae	<i>Corvus corax</i>	Common Raven	179725	Present in Park	Common	Resident
Passeriformes	Alaudidae	<i>Eremophila alpestris</i>	Horned Lark	554256	Present in Park	Common	Resident
Passeriformes	Hirundinidae	<i>Tachycineta bicolor</i>	Tree Swallow	178431	Present in Park	Common	Breeder
Passeriformes	Hirundinidae	<i>Tachycineta thalassina</i>	Violet-green Swallow	178427	Present in Park	Uncommon	Migratory
Passeriformes	Hirundinidae	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	178443	Present in Park	Uncommon	Breeder
Passeriformes	Hirundinidae	<i>Riparia riparia</i>	Bank Swallow	178436	Present in Park	Common	Breeder
Passeriformes	Hirundinidae	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	178453	Present in Park	Common	Resident
Passeriformes	Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow	178448	Present in Park	Common	Breeder
Passeriformes	Paridae	<i>Poecile atricapillus</i>	Black-capped Chickadee	178699	Present in Park	Common	Resident
Passeriformes	Paridae	<i>Poecile gambeli</i>	Mountain Chickadee	178718	Present in Park	Common	Resident
Passeriformes	Sittidae	<i>Sitta canadensis</i>	Red-breasted Nuthatch	178784	Present in Park	Common	Resident
Passeriformes	Sittidae	<i>Sitta carolinensis</i>	White-breasted Nuthatch	178775	Probably Present	N/A	N/A

Appendix C. Continued.

Order	Family	Standard Scientific Name	Common Name	TSN	Park Status	Abundance	Residency
Passeriformes	Certhiidae	<i>Certhia americana</i>	Brown Creeper	178803	Present in Park	Uncommon	Resident
Passeriformes	Certhiidae	<i>Salpinctes obsoletus</i>	Rock Wren	178614	Probably Present	N/A	N/A
Passeriformes	Certhiidae	<i>Troglodytes aedon</i>	House Wren	178541	Present in Park	Common	Breeder
Passeriformes	Certhiidae	<i>Troglodytes troglodytes</i>	Winter Wren	178547	Present in Park	Rare	Breeder
Passeriformes	Certhiidae	<i>Cistothorus palustris</i>	Marsh Wren	178608	Present in Park	Common	Breeder
Passeriformes	Cinclidae	<i>Cinclus mexicanus</i>	American Dipper	178536	Probably Present	N/A	N/A
Passeriformes	Regulidae	<i>Regulus satrapa</i>	Golden-crowned Kinglet	179865	Present in Park	Common	Breeder
Passeriformes	Regulidae	<i>Regulus calendula</i>	Ruby-crowned Kinglet	179870	Present in Park	Common	Breeder
Passeriformes	Muscicapidae	<i>Sialia currucoides</i>	Mountain Bluebird	179811	Present in Park	Common	Resident
Passeriformes	Muscicapidae	<i>Myadestes townsendi</i>	Townsend's Solitaire	179824	Present in Park	Common	Breeder
Passeriformes	Muscicapidae	<i>Catharus fuscescens</i>	Veery	179796	Present in Park	Common	Breeder
Passeriformes	Muscicapidae	<i>Catharus ustulatus</i>	Swainson's Thrush	179788	Present in Park	Uncommon	Migratory
Passeriformes	Muscicapidae	<i>Catharus guttatus</i>	Hermit Thrush	179779	Present in Park	Uncommon	Breeder
Passeriformes	Muscicapidae	<i>Turdus migratorius</i>	American Robin	179759	Present in Park	Common	Breeder
Passeriformes	Turdidae	<i>Ixoreus naevius</i>	Varied Thrush	179773	Probably Present	N/A	N/A
Passeriformes	Sturnidae	<i>Dumetella carolinensis</i>	Gray Catbird	178625	Present in Park	Uncommon	Breeder
Passeriformes	Sturnidae	<i>Mimus polyglottos</i>	Northern Mockingbird	178620	Probably Present	N/A	N/A
Passeriformes	Sturnidae	<i>Sturnus vulgaris</i>	European Starling	179637	Present in Park	Common	Resident
Passeriformes	Passeridae	<i>Anthus rubescens</i>	American Pipit	554127	Present in Park	Common	Migratory
Passeriformes	Bombycillidae	<i>Bombycilla garrulus</i>	Bohemian Waxwing	178529	Present in Park	Common	Breeder
Passeriformes	Bombycillidae	<i>Bombycilla cedrorum</i>	Cedar Waxwing	178532	Present in Park	Uncommon	Breeder
Passeriformes	Fringillidae	<i>Vermivora celata</i>	Orange-crowned Warbler	178856	Present in Park	Uncommon	Breeder
Passeriformes	Fringillidae	<i>Dendroica petechia</i>	Yellow Warbler	178878	Present in Park	Common	Breeder
Passeriformes	Fringillidae	<i>Dendroica coronata</i>	Yellow-rumped Warbler	178891	Present in Park	Common	Breeder
Passeriformes	Fringillidae	<i>Dendroica townsendi</i>	Townsend's Warbler	178897	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Seiurus noveboracensis</i>	Northern Waterthrush	178931	Present in Park	Uncommon	Breeder
Passeriformes	Fringillidae	<i>Oporornis tolmiei</i>	MacGillivray's Warbler	178940	Present in Park	Rare	Breeder
Passeriformes	Fringillidae	<i>Geothlypis trichas</i>	Common Yellowthroat	178944	Present in Park	Common	Breeder
Passeriformes	Fringillidae	<i>Wilsonia pusilla</i>	Wilson's Warbler	178973	Present in Park	Uncommon	Migratory
Passeriformes	Fringillidae	<i>Icteria virens</i>	Yellow-breasted Chat	178964	Present in Park	Rare	Migratory
Passeriformes	Fringillidae	<i>Piranga olivacea</i>	Scarlet Tanager	179883	Probably Present	N/A	N/A

Appendix C. Continued.

Order	Family	Standard Scientific Name	Common Name	TSN	Park Status	Abundance	Residency
Passeriformes	Fringillidae	<i>Piranga ludoviciana</i>	Western Tanager	179882	Present in Park	Common	Breeder
Passeriformes	Fringillidae	<i>Pipilo chlorurus</i>	Green-tailed Towhee	179310	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Pipilo maculatus</i>	Spotted Towhee	554380	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Spizella arborea</i>	American Tree Sparrow	179432	Present in Park	Common	Migratory
Passeriformes	Fringillidae	<i>Spizella passerina</i>	Chipping Sparrow	179435	Present in Park	Common	Resident
Passeriformes	Fringillidae	<i>Spizella pallida</i>	Clay-colored sparrow	179439	Present in Park	Uncommon	Breeder
Passeriformes	Fringillidae	<i>Spizella breweri</i>	Brewer's Sparrow	179440	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Poocetes gramineus</i>	Vesper Sparrow	179366	Present in Park	Common	Resident
Passeriformes	Fringillidae	<i>Chondestes grammacus</i>	Lark Sparrow	179371	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Calamospiza melanocorys</i>	Lark Bunting	179312	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Passerculus sandwichensis</i>	Savannah Sparrow	179314	Present in Park	Common	Resident
Passeriformes	Fringillidae	<i>Melospiza melodia</i>	Song Sparrow	179492	Present in Park	Common	Resident
Passeriformes	Fringillidae	<i>Melospiza lincolni</i>	Lincoln's Sparrow	179484	Present in Park	Common	Migratory
Passeriformes	Fringillidae	<i>Melospiza georgiana</i>	Swamp Sparrow	179488	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Zonotrichia albicollis</i>	White-throated Sparrow	179462	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Zonotrichia querula</i>	Harris's Sparrow	179454	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Zonotrichia leucophrys</i>	White-crowned Sparrow	179455	Present in Park	Uncommon	Migratory
Passeriformes	Fringillidae	<i>Junco hyemalis</i>	Dark-eyed Junco	179410	Present in Park	Common	Breeder
Passeriformes	Fringillidae	<i>Calcarius lapponicus</i>	Lapland Longspur	179526	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Plectrophenax nivalis</i>	Snow Bunting	179532	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak	179140	Present in Park	Uncommon	Breeder
Passeriformes	Fringillidae	<i>Passerina amoena</i>	Lazuli Bunting	179151	Present in Park	Uncommon	Breeder
Passeriformes	Fringillidae	<i>Dolichonyx oryzivorus</i>	Bobolink	179032	Present in Park	Uncommon	Breeder
Passeriformes	Fringillidae	<i>Agelaius phoeniceus</i>	Red-winged Blackbird	179045	Present in Park	Common	Breeder
Passeriformes	Fringillidae	<i>Sturnella neglecta</i>	Western Meadowlark	179039	Present in Park	Common	Breeder
Passeriformes	Fringillidae	<i>Xanthocephalus xanthocephalus</i>	Yellow-headed Blackbird	179043	Present in Park	Common	Breeder
Passeriformes	Fringillidae	<i>Euphagus carolinus</i>	Rusty Blackbird	179091	Present in Park	Rare	Migratory
Passeriformes	Fringillidae	<i>Euphagus cyanocephalus</i>	Brewer's Blackbird	179094	Present in Park	Common	Breeder
Passeriformes	Fringillidae	<i>Quiscalus quiscula</i>	Common Grackle	179104	Present in Park	Uncommon	Breeder
Passeriformes	Fringillidae	<i>Molothrus ater</i>	Brown-headed Cowbird	179112	Present in Park	Common	Breeder
Passeriformes	Fringillidae	<i>Icterus bullockii</i>	Bullock's Oriole	554267	Present in Park	Uncommon	Breeder

Appendix C. Continued.

Order	Family	Standard Scientific Name	Common Name	TSN	Park Status	Abundance	Residency
Passeriformes	Fringillidae	<i>Leucosticte tephrocotis</i>	Gray-crowned Rosy-Finch	179215	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Leucosticte atrata</i>	Black Rosy-Finch	179222	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Pinicola enucleator</i>	Pine Grosbeak	179205	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Carpodacus cassinii</i>	Cassin's Finch	179190	Present in Park	Common	Resident
Passeriformes	Fringillidae	<i>Carpodacus mexicanus</i>	House Finch	179191	Present in Park	Common	Breeder
Passeriformes	Fringillidae	<i>Loxia curvirostra</i>	Red Crossbill	179259	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Loxia leucoptera</i>	White-winged Crossbill	179268	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Carduelis flammea</i>	Common Redpoll	179230	Present in Park	Uncommon	Migratory
Passeriformes	Fringillidae	<i>Carduelis hornemanni</i>	Hoary Redpoll	179231	Probably Present	N/A	N/A
Passeriformes	Fringillidae	<i>Carduelis pinus</i>	Pine Siskin	179233	Present in Park	Common	Breeder
Passeriformes	Fringillidae	<i>Carduelis tristis</i>	American Goldfinch	179236	Present in Park	Uncommon	Breeder
Passeriformes	Fringillidae	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	179173	Present in Park	Common	Breeder
Passeriformes	Passeridae	<i>Passer domesticus</i>	House Sparrow	179628	Present in Park	Common	Resident

Appendix D. Management recommendations for birds of Grant-Kohrs Ranch National Historic Site listed as “Priority for conservation needs” in The Montanan Partners in Flight Bird Conservation Plan (Young 2000).

Bald Eagle – Bald Eagles populations declined dramatically in the 1960’s due to pesticide usage. As a result the species was listed as an endangered species. The population has recovered successfully and down-listed to threatened, but still needs to be monitored. This species requires mature riparian forest in which to place nests and areas with no human disturbance are essential for successful nesting.

Northern Harrier – Throughout North America, Northern Harrier populations have declined due to loss of wetland habitat. This species places its nest on the ground in wetlands or marshy areas. It is necessary to set aside areas where humans or grazing livestock will not disturb the nesting activities of this species during the nesting season.

Swainson’s Hawk – This species will nest in isolated trees or stands of trees that are away from human activity. Swainson’s Hawks also require an abundance of small rodents and grasshoppers which is their primary prey.

Killdeer – Killdeer are common, however, populations have been declining for the past 25 years. Killdeer like open and disturbed areas for nesting and this creates a problem for them as these areas are typically grazed and their nests often end up being trampled. Some good ways to assist this species’ nesting success is by “fencing off” portions of pasture or by placing temporary fences around areas where it is known to be nesting.

Greater Yellowlegs, Long-billed Dowitcher, and Red-necked Phalarope - Although not particularly scenic or pristine the sewage lagoons at GRKO are important areas for migrating shorebirds to stop during their long migrations and refuel. Invertebrates that also assist with the breakdown of human wastes are important food for migrating shorebirds. Each shorebird species has its own preference of water depth and substrate for foraging. Some species prefer open mudflats and some forage in shallow water. If water levels can be controlled this area could benefit a wide diversity of shorebirds species.

Spotted Sandpiper – This species breeds throughout western Montana and requires exposed gravel in or near rivers where it lays its eggs. It is important to have un-grazed riparian habitat for successful nesting areas for this species.

Long-billed Curlew – This “shorebird” nests in open dry grasslands that have water nearby. Long-billed Curlews like grass-dominated areas with a variety of grass heights to provide habitat for nesting, foraging, and raising chicks. They prefer native grasslands, but will use croplands if the vegetative structure is correct. If nesting locations are found, they should be temporarily fenced so that eggs are not trampled.

Appendix D. Continued.

Wilson's Snipe – Breeding by this species was not confirmed at GRKO, but it is highly likely. Wilson's Snipe likes marshy areas with tall grass for foraging and nesting. This species benefits by having some wet marshy areas kept free from grazing during the breeding season.

Wilson's Phalarope – This species will nest on the edges of wet meadows or marshes in shorter vegetation. Some areas that meet these criteria should be left un-grazed during the breeding season.

Red-naped Sapsucker – This sapsucker will construct cavities for nesting in birch or alder if they are large enough but prefers cottonwood trees. The riparian corridor at GRKO will provide nesting areas for this species as long as there are deciduous trees available. Leaving dead trees standing is important for this species as they will use snags for nesting and foraging.

Downy Woodpecker – Another species that relies on deciduous trees in riparian areas for nesting and foraging. Downy Woodpeckers would also benefit from leaving dead trees standing.

Willow Flycatcher – This species has been listed as an endangered species in the southwestern United States due to habitat loss. Populations seem stable in the northern part of its range, but monitoring should continue. As the name suggests, it likes thick stands of willow, alder, or birch along rivers or creeks in which to nest and forage.

Least Flycatcher – This species likes a mixture of taller cottonwood trees with a strong mid-story component. Allowing the riparian forests to remain dense, providing good cover, should provide areas for this species to breed.

Cassin's Vireo – This species utilizes the riparian corridor at GRKO during migration.

Warbling Vireo – Warbling Vireos like dense riparian habitat in which to breed. Although this species was not detected on the point count transects, it is possible that it could breed in the cottonwood forests along the Clark Fork river.

Gray Catbird – This species requires dense riparian cover with limited overstory. Populations are stable in Montana, but should be monitored. This species was detected during the breeding season and, although not confirmed, most likely breeds at GRKO.

MacGillivray's Warbler – This species also relies on thick brushy riparian corridors. Allowing the riparian habitat along the Clark Fork to remain the way it is will provide nesting habitat for this species.

Appendix D. Continued.

Clay-colored Sparrow – Only one Clay-colored Sparrow was heard singing during the breeding season. This species is at the edge of its range at GRKO. Grasslands with some shrub cover provide habitat for it to breed.

Song Sparrow – A common breeding bird of riparian corridors, this species is an indicator of quality riparian habitat. This species should remain common at GRKO as long as the riparian corridor remains healthy.

Lazuli Bunting – Although not detected on point counts, this species could breed at GRKO. Allowing the riparian corridor to remain as it is will provide sufficient cover for this species.

Bobolink – This species likes relatively tall grass with little forbs. This type of habitat can be maintained through light grazing. As the population of Bobolinks at GRKO seems to be thriving, park managers are doing a good job of providing the preferred habitat of this species. One recommendation would be to not introduce grazing into an area where this species is suspected to be breeding. MTPIF suggests delaying mowing or grazing a breeding area until 15 July to allow successful fledging of nestlings.

Red-winged Blackbird – This species is declining in Montana and its populations should be monitored closely. This species is closely tied to wetland habitat and allowing some areas to remain in cattails will provide areas for it to breed.

Yellow-headed Blackbird – This species likes habitat with emergent vegetation (bulrushes or cattails) growing in deeper water. Allowing this type of vegetation to remain healthy will provide breeding locations for this species.

Brewer's Blackbird – Another seemingly abundant species that is declining in Montana. This species prefers grassland habitat and it should be closely monitored.

Cassin's Finch – This species breeds in coniferous forests. GRKO does offer important wintering habitat for this species, however.

Appendix E. Point count transects conducted in Grant-Kohrs Ranch National Historic Site and their locations, dates, and observer.

Transect or Point Count ID	Location	Date	Observer
GKRI	Clark Fork River	7/1/2004	Jason Beason
GKUP	Uplands	6/30/2004	Jason Beason

Jason Beason – Jason Beason became a full-time employee of RMBO in 2002. He has a bachelors degree in Natural Resources. At RMBO, he works in the monitoring division and currently supervises the Monitoring the Birds of Carson National Forest project in New Mexico and assists with the *Monitoring Colorado's Birds* project in Colorado. He has worked as a field ornithologist since 1992 in Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming. He has been surveying birds throughout the western United States since 1995.

Appendix F. Rocky Mountain Bird Observatory Point Count Transect Protocol.

Project overview

Rocky Mountain Bird Observatory (RMBO) in cooperation with Colorado Division of Wildlife, U.S. Forest Service, Bureau of Land Management, and other agencies, has developed a program to monitor bird populations in Colorado that utilizes point counts along transects (i.e., point transects) as the primary sampling technique. The point-transect portion of this program has been designed to be statistically rigorous and biologically sound. This document delineates the design and operation of our point transect program. It is intended to instruct our field workers on how to establish and run the transects and for others to follow when establishing monitoring projects of their own, so that design and methods are comparable.

Materials

Before heading out into the field, each technician should be sure s/he has the following:

- A timepiece with a countdown timer and a chime;
- Binocular;
- A declination-adjustable compass with sighting capability (i.e., a mirror);
- A clipboard;
- At least two writing utensils – in case you lose one (pencil or indelible ink pen);
- GPS unit;
- Laser Rangefinder;
- Extra batteries;
- Data forms sufficient for the transect planned that morning;
- A master list of four-letter codes taped to the clipboard for easy access;
- A master list of weather and habitat codes, also taped to the clipboard; and
- A random numbers table, if establishing a new transect.

Setting up new sites

Transects are established in GRKO. If additional or replacement transects are desired, please refer to Leukering et al. (2003) for protocol.

Conducting the point count transects

Seasonal Timing- Point transect counts should be performed after all migratory species have returned to the area and as early in the season as possible, but beware of performing them too early and potentially counting a lot of transient migrants, or missing some of the breeders that have not yet arrived. Also, transects within a given habitat should all be performed in as short a period as possible--within three weeks; less, if possible.

Obviously, counts performed in grasslands in late May are not comparable to counts performed in the same habitat in early July, as most locally breeding species have completed nesting and are much less vocal in July than they were in May. By limiting the period in which transects in given habitats are performed, we reduce the amount of seasonal variability in singing rates, and hence detections, that we capture in our data.

Appendix F. Continued.

Upon reaching a point, fill out ALL the UTM and habitat data on page 1 of the field form first (including directions to point). Do not begin counting until after this is done. Doing this first is important for two reasons: it will ensure that you do not forget to write it down, as is possible if you wait until after the count is done, and it will allow the local birds to “settle down” somewhat after the disturbance you created when approaching the point. If the GPS unit is taking a long time to get a stable reading, record all other site information and begin the count, but leave the GPS unit on and don’t forget to take a reading before you leave the station! However, you only need to record UTM locations for new sites; for established sites, simply use the GPS to get to the exact location of the point.

Habitat data- Pay particular attention to filling in the squares in the habitat block of the data form for each of the 15 points per transect while at each point. The habitat data will be used to relate bird use with vegetative features of the habitat and will have real applications for managing habitats for birds, so please be thoughtful in providing these data. At each point, describe the habitat around the point-count station by selecting the best and next-best habitat classifications that describe the landscape around the point. When more than two habitats make up significant components of the landscape around you, select the one habitat that occupies the most area around you as “best habitat” and for “next best habitat” select the habitat that is contributing the most birds to the count (other than the “best habitat”). For each habitat selected, you should also assess the seral (or structural) stage and canopy closure of those habitats (see Appendix D for detailed descriptions of habitat classifications and seral stages). Next, select the primary understory vegetation category that best reflects the dominant woody understory vegetation within a 50 m radius around the count station, and estimate the percent of that 50 m radius occupied by that vegetation type.

Bird data- After the general habitat data are recorded at the point count station, activate your timepiece and begin counting and recording the birds you see and/or hear. The count duration is 5 minutes. It is important to use a timepiece that has a count-down timer and a chime that rings at the end of the period. This avoids counting birds beyond the duration of the count and eliminates having to look at the timepiece to see how much time remains in the count, and thus potentially miss birds. All birds detected during the 5-minute count period should be recorded using the correct 4-letter codes. Birds flushed from the count station upon arrival should also be recorded (and their distance from the point measured), as it is assumed that these birds would have remained at their original locations were it not for the disturbance created by the observer.

In short, for each bird you record on a point transect, you should also record:

- 1) the radial distance from you to the bird;
- 2) how the bird was detected;
- 3) the sex of the bird (if known).

Appendix F. Continued.

Measuring Distances- Using the rangefinder, measure (or estimate when necessary, using the rangefinder as a gauge) the distance from the point to each and every individual bird detected during the count and record the distance on the data sheet under “Radial Distance”. Every bird recorded on point transects must have a radial distance measurement associated with it. This is imperative! Because this monitoring program relies on distance-sampling techniques and analyses, birds without associated distances are essentially useless and cannot be analyzed with the larger datasets.

All distances should be measured using the binocular rangefinder whenever possible. If you cannot get a direct line of sight to the location of a bird, use the rangefinder to measure to a point close to that bird, and then add or subtract the estimated distance between that point and the bird to obtain the best possible distance estimate from the point to the bird. Distance sampling relies upon the assumption that all distances are measured to within 10% of true accuracy, so use your rangefinders as much as possible! Always measure distances to where the bird was first detected, not necessarily to where it was first identified. For low-density target species observed at point counts, measure the radial distance to each bird (or estimate when necessary) and record the bearing from the point to the bird (see Transect counts, below). For birds that are vocalizing but not seen, try to pin-point their locations to a specific tree/bush, then measure the distance to that tree. If you are unable to pin-point its location to a specific tree/bush, then estimate the distance, but do not round distances to the nearest 5- or 10-m interval. Rounding distances causes heaping at popular values and makes analysis more problematic. If you see/hear a bird that is beyond the range of the rangefinder, measure to the furthest object in the direction of the bird that the rangefinder can measure to, and estimate the distance beyond that object to the bird. Add your estimate plus the measured distance and record the sum as the total distance.

Other Bird-related Data- In the “How” column, record how each bird was detected, i.e., whether the bird was detected by ear (C=calling, S=singing, D=drumming, O=other, e.g. wing beats) or by sight (V=visual). In the “Sex” column, record the sex of the bird, if known (F=female, M=male, U=unknown). Assume that a singing bird is a male unless it is an individual of a species of tanager or of the Cardinalidae. However, if an individual bird is singing emphatically and repeatedly, then record it as a male, regardless of species. Females of many species will sing, although generally their songs are less emphatic and extensive. Unseen birds (or monomorphic birds that are seen) giving only non-sex-specific calls should not be sexed.

Example: On point 1 of a Ponderosa Pine transect, you detect six birds. You see a male HAWO, hear a drumming WISA, a calling WBNU, a continuously singing WETA, a singing CHSP, and you see a brown-plumaged CAFI. You should make estimates of radial distances for all six individuals and take bearings for the two woodpeckers and the CAFI. In order, the “How” column should be filled in with V, D, C, S, S, and V. The “Sex” column should be filled in: M, U, U, M, M, and U, respectively (male CAFI

Appendix F. Continued.

require two years to achieve adult plumage, thus a brown-plumaged bird cannot be sexed in the field).

Flyovers- For flyovers, enter the species code and an “F” in the “How” column and draw a short line through the distance column – i.e. you do not need to estimate distance for flyovers. For individuals of species that habitually hunt on the wing (e.g., raptors, swifts, swallows), record those individuals that appear to be foraging as on the point, not *as* flyovers. Additionally, individuals that are first detected in flight, but that are simply flying from perch to perch within the habitat should NOT be recorded as flyovers. Provide distance estimates to those flying individuals that you record as using the habitat around the point. Thus, estimate distance to the point at which you first saw the bird(s) and record the best how-detected variable.

Other Survey Tips- While conducting counts, be sure to look and listen in all directions, including up. It is best to slowly rotate in place while you are counting; making three complete turns in the five minutes is probably adequate. Don't forget to look up! It is very important to stay in one place while counting - *it is called a point count for a reason*. It is acceptable to take a step or two away from the point in order to identify a bird that you have detected from a point, but cannot identify from the point, but always return ASAP to the point. Do NOT chase birds during the count. After the five minutes are up, you may chase down a bird that you couldn't identify on the point in order to get an identification for the point, but do not leave the point during the five minutes and do NOT record birds on the point count that were found only while you were chasing another bird. Remember: Consistency of methods and coverage is the key to useful data! Be aware of what is going on around you and realize that you will hear individual birds on multiple points. When at a point, DO NOT count an individual bird that you saw and/or heard on a previous point.

Example 2: On a Grassland point, you see an adult male NOHA quartering low over the habitat. You record it for that point, finish the point, and walk to the next point. After writing down the point information, you start the count. You look in the direction of the previous point and see two NOHAs, one of which is an adult male. For the second point, you should record only one NOHA, as you probably recorded the adult male on the previous point.

Example 3: At the same point as above, you hear two WEMEs singing, each bird roughly perpendicular to the transect line on opposite sides of the transect from each other. When you start the next point count, you hear three WEMEs, two from back by the previous point on opposite sides of the transect and one in the opposite direction toward the third point. You would record only one WEME for the second point, as you already recorded two WEME from that area on the first point.

Appendix F. Continued.

Potential problems when conducting point counts

Window species- This is “listening through” (not detecting) a particular common species because you are habituated to it (Mourning Dove is a common window species).

Looking/listening everywhere- Be sure to look up regularly, particularly in taller forest types and, particularly if you are wearing a hat. Be sure to look and listen in all directions (try to look and listen in all directions about equally).

Stand at points- Do not sit or kneel, as this can reduce the number of individuals recorded, by decreasing visibility, audibility and dexterity. If you are tired, take a short break after the point count.

Recording data- Do not use a second person as a scribe; this can enable the observer to record more birds (or fewer, if the scribe detracts from the job at hand or creates more disturbance), therefore those points are not comparable to points that were conducted by one person.

NO pishing- Do not attract birds to you. Pishing is permissible after the count in order to attempt to identify an individual that was not identifiable on the count, but do not add other individuals after the count that were not first detected during the count period.

Airplane (and other) noise- If audibility of birds is reduced by mechanical noise, interrupt the count (i.e., stop your timer), and restart when the noise abates so that the total time still equals a five-minute count.

Guessing- Never guess on the identity of a bird. Instead, use an unknown code (*e.g.* unidentified sparrow - UNSP) for those individuals about which you’re not sure.

However, recording a lot of unidentified birds is an indication that you need to learn/practice more before performing point counts.

Practice- Practice in habitat before conducting actual counts. Be familiar with the songs and calls of all species found in a habitat before conducting point transects in that habitat. Use the habitat-specific bird lists along with CDs or tapes to practice before (and during) the field season.

Explanation of field form and data codes

Transect #: Enter the transect number.

Observer: Enter your first two initials and your full last name.

Date: Enter the date in the format: MM-DD-YY

Time: Enter start and stop times for entire transect (not individual points) using 24-hour clock.

Sky (start and end): Enter one-digit codes at beginning and end of transect (not at points)

0=0-15% cloud cover 1=16-50% cloud cover 2=51-75% cloud cover

3=76-100% cloud cover 4=fog 6=drizzle

You shouldn’t conduct counts in any other conditions!

Wind (start and end): Enter one-digit codes at beginning and end of transect.

0=Less than 1 mph; smoke rises vertically

1=1-3 mph; smoke drift shows wind direction

2=4-7 mph; leaves rustle, wind is felt on face

3=8-12 mph; leaves, small twigs in constant motion; light flag extended

4=13-18 mph; raises dust, leaves, loose paper; small branches in motion

Appendix F. Continued.

YOU SHOULDN'T CONDUCT COUNTS IN ANY OTHER CONDITIONS!

Temperature: (start and end): Use F (no thermometer?, estimate to nearest 5 degrees)

UTM data: Enter the UTM coordinates (using NAD27 CONUS datum in navigation setup) for each point-count station associated with a new site (for established sites, only take a GPS reading if you are moving the count station; in these cases, provided new directions to the count station as well). Be sure that the GPS reading is essentially stable before recording the UTM location. Record all new UTM coordinates in the appropriate spaces provided on the field form and save all new UTM coordinates in the GPS units using the "Mark Waypoint" feature.

Within 100m of road (Y/N): Enter "Y" for yes and "N" for no for each point based on your best knowledge of the site. For our purposes, a "road" must be substantial enough so that it either causes a significant disruption of the understory vegetation or a break in the canopy. For example, a grass 2-track running through an open meadow should not be considered a road, whereas a gravel or dirt road that forms a 3 to 4-m wide break in the grass cover would be considered a road. Similarly, an old, pine needle-covered logging track in an open forest situation should not be considered a road, whereas a logging road that causes a clear and wide break in the woody understory vegetation, or in the forest canopy, should be considered a road.

Bearing to point: Enter the true bearing (do not use magnetic bearings) you followed from the previous point (or access point) to arrive at the current point.

Best habitat classification: Enter the two-letter code of the habitat that BEST describes the habitat surrounding the point-count station. Consider the entire landscape around the count station from which you are picking up birds and select the dominant habitat type that occupies the greatest amount of this area.

Habitat classification codes:

GR=Grassland RI=Riparian

Best habitat seral stage and canopy closure: Enter one-digit of seral stage of habitat used in best habitat classification, followed by a one-letter code for canopy closure:

1=grass-forb stage 2=shrub-seedling stage 3=sampling-pole stage

4=mature stage 5=old growth

a=<40% canopy closure b=40-70% canopy closure c=>70% canopy closure

Seral stage assessment:

1 = Grass-Forb stage: Grasses and forbs dominate; aspen suckers/saplings are absent.

2 = Shrub-Seedling stage: Suckers/saplings are present, up to 2 inches dbh and 4 m in height. Stem density can vary from 5,000 to 40,000 stems per acre.

3 = Sapling-Pole stage: Saplings between 2 and 8 inches dbh and up to 6-13 m in height on good sites; on poorer sites trees may never reach 8 inches dbh and may be shorter than 6 m, with crooked and twisted boles.

4 = Mature stage: Trees > 8 inches dbh; on better sites, trees between 16-24 inches dbh and 28-33 m in height. Typically, there is a high density of grass,

Appendix F. Continued.

forbs and shrubs in the understory. Snags are also generally common in this stage.

5 = Old-Growth stage: Large diameter trees and many snags are present, as are diseased trees and downed material. Snags may occur in large groups in this stage.

Next-best habitat classification: Enter two-letter code of habitat that NEXT best describes the habitat surrounding the point. Consider the entire landscape from which you are picking up birds and select the next-most dominant habitat type occupying the greatest amount of this area OR *select the habitat that is contributing the most birds to the point count* (if different than the Best Habitat).

Primary understory classification: Enter two-letter code for primary understory vegetation type that best describes the understory within a 50-m radius of the point:

BG=bare ground *GO=Gambel's oak* *GF=grass/forb*
MM=mountain mahogany *NS=not sage or willow* *SA=sage*
SV=serviceberry *SN=snowberry* *WI=willow*

Primary understory percentage: Estimate the percent coverage of the primary understory type within a 50-m radius of point and enter the 1-digit code:

1=1-20% *2=21-40%* *3=41-60%* *4=61-80%* *5=81-100%*

Secondary understory classification: Enter two-letter code for secondary understory type that NEXT BEST describes the understory within a 50-m radius of the point, as described above.

Secondary understory percentage: Estimate the percent coverage of the secondary understory type within a 50-m radius of point, as described above.

Point #: Enter number of point (01-15) on the transect;

Species: Enter **CORRECT** four-letter code for birds; please use correct codes, as it makes data entry and analysis easier. Species that cause particular problems for observers include: **Northern Shoveler** (NSHO, not NOSH), **Ring-necked Pheasant** (RINP, not RNPH), **Western Wood-Pewee** (WEWP, not WWPE), **Gray Jay** (GRAJ, not GRJA), **Tree Swallow** (TRES, not TRSW), **Bank Swallow** (BANS, not BASW), **Barn Swallow** (BARS, not BASW), **MacGillivray's Warbler** (MGWA, not MAWA), **Yellow Warbler** (YWAR, not YEWA), **Yellow-rumped Warbler** (AUWA - for Audubon's Warbler, MYWA for Myrtle's Warbler, not YRWA), **Lark Bunting** (LARB, not LABU), **Sage Sparrow** (SAGS, not SASP), **Savannah Sparrow** (SAVS, not SASP), **Lazuli Bunting** (LAZB, not LABU) and **Red-winged Blackbird** (RWBL, not RWBB).

Radial Distance: Measure radial distance (estimate only when necessary) to each bird (that is, direct distance from point to bird), using a binocular rangefinder, in one-meter units (when estimating, DO NOT round off to five- or ten-meter units) – if beyond a kilometer (1000 meters), fit number in the tree spaces provided as best you can.

How: Enter code for how each individual was detected: C=calling; S=singing; D=drumming; O=other aural cue (i.e., the sound of the wings that Mourning Doves make when flushed); V=visual; F=flyover; K=Flock.

Sex: Enter code for sex: M=male; F=female; U=unknown.

Appendix F. Continued.

Other important reminders

Before leaving your transect sites, don't forget to:

1) skip a line between entries for individual points and/or individual legs of the transect. That is, all individual birds on a particular point should be bunched together on the form; then you should leave a blank line before starting entries for the next transect leg (or point).

2) enter transect and page #'s at the bottom of EACH page!

3) record the end of transect data (time, temp, sky, wind, transect notes) immediately upon completing the last point count!

4) go through your data sheets carefully to make sure that you have not forgotten to record any data. Your work is not done until you've reviewed your data from the morning!