**Breeding Bird Monitoring Protocol for the Heartland Inventory and Monitoring Network**

**Standard Operation Procedure 1: Preparations & Equipment Setup Prior to**

**Field Season**

**Version 3.00 (05/03/2019)**

**Revision History Log:**

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| Previous Version # | Revision Date | Author | Changes Made | Reason for Change | New Version # |
| 1.00 | Jun. 2004 | D.G. Peitz | Edited wording page 2 | Edited to reflect changes in the annual sampling effort at TAPR | 1.01 |
| 1.01 | May 2008 | D.G. Peitz | Entire document | Edited to reflect that bird monitoring has been expanded to ten additional network parks | 2.00 |
| 2.00 | May 2019 | D.G. Peitz | Updated throughout to NRR format. Minor edits throughout the documents. | Updated throughout to NRR format per NRSS guidelines. | 3.00 |
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This Standard Operating Procedure (SOP) gives step-by-step instructions on how to prepare for breeding bird monitoring on National Park Service lands within the Heartland Inventory and Monitoring Network (HTLN). Prior to the field season each year, usually beginning in March or April, all observers should review this entire protocol, including SOPs. Review of bird identification by sight and sound (SOP 2 “Training Observers”) is particularly important; misidentification of a species is perhaps the most serious error that can be made during a bird count. Misidentification is much more serious than errors in estimating distances or double counting a bird. This SOP also gives a brief description of how bird monitoring should be scheduled. Preseason planning facilitates the completion of both bird surveys and habitat work. All observers should follow the outlined field schedule to avoid double-sampling of plots or initiating habitat work on a plot prior to it being sampled for birds. All the equipment and supplies listed in this SOP should be organized and made ready for the field season, and copies of the field data forms in SOP 4 “Conducting the Variable Circular Plot Count” and SOP 5 “Documenting Habitat Variables” should be made. Approximately twenty-five percent of the field data forms should be copied to write-in-the-rain paper.

**General Preparation and Review**

**Procedures:**

1. Notebooks from previous surveys should be reviewed if available to identify any unique events that may be encountered. A field notebook for the survey year should be prepared with pages for entry of sampling schedules, observer names, field hours and unique happenings that may influence how the data are reported. Trip reports are based on information recorded in field notebooks, so it is imperative that they are clearly organized for ease of field note entry.
2. Prior knowledge of species most likely to be encountered in a park will aid birders in preparing for the birding season. Therefore, species lists from previous birding efforts in a park or local area should be compiled and compared to reference manuals to identify species likely to be recorded. Copies of these combined species list should be carried into the field as quick references in helping to identify unknown birds. Appendix C in the Narrative list avian species with some probability of being encountered during the breeding season by park.
3. Waypoints for each variable circular plot (VCP) must be loaded onto the GNSS unit prior to the start of the field season. Waypoints are the X and Y coordinates for each VCP and are used to navigate to their location. Appendix B in the Narrative contains lists of VCP locations with their associated UTM coordinates by park. Waypoints for bird plots are stored on the HTLN server in the *SpatialInfo* folder of the *GrasslandBirds* project folder.
4. Print maps with plot numbers on them for both the birding and habitat crews.
5. Obtain two-way radios, charge, and check channel assignments and review radio etiquette before fieldwork commences.
6. Collect and check equipment.

**Scheduling Field Work**

**Procedures:**

1. Breeding bird surveys will begin no sooner than the first full week of May and extend no later than the second full week of June, a period that coincides with the peak breeding activity of most birds. Inclement weather and personnel workloads will preclude the scheduling of sampling events to specific annual dates. Sampling dates should be scheduled, and logistics organized prior to the start of each field season. Habitat monitoring must be completed by June 30, as changing habitat conditions later in the season due to plant growth and large ungulate grazing (where permitted) reduce the ability of survey data to properly correlate bird populations with habitat type.
2. Fifteen to twenty variable circular plots (VCP) should be scheduled for completion each field day. Bird surveys should start each morning at approximately 30 minutes before official sunrise and end no later than four hours after official sunrise. Determine which plots will be sampled for habitat measures based on the order they will be sampled for birds. Habitat sampling should only be done on plots already sampled for birds that morning, after the morning survey is completed, or on days when a plot will not be surveyed for birds to avoid disturbing birds prior to sampling.
3. If habitat sampling is to be done on plots surveyed for birds that morning, the habitat observers can start as soon as the first bird plot for that day has been completed. Observers should stay back from the plot until it is surveyed for birds as not to disturb them. However, they should have a sense of where the birder is and when he/she will be done surveying the plot. Two-way radios work well to communicate when a plot is ready for habitat sampling. A minimum of two people will start the habitat work, with the birder joining them after that day’s survey is done if available.

**Organizing Supplies and Equipment**

**Procedures:**

An equipment list should be compiled, and equipment organized and made ready for the field season several weeks in advance of the field season. This allows time to make needed repairs and order equipment. The following is a list of field equipment needs for one crew; if two or more crews work simultaneously, equipment needs will change accordingly.

**Table 1.0.** Field equipment list for variable circular plot bird counts and habitat work.

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| **Number Req.** | **Description** |
|  | **Bird surveys** |
| 1 | HTLN bird identification reference book with species separated by parks |
| 1 | Binoculars |
| 1 | Rangefinder (1000 m. range or better) |
| 1 | Tape recorder for recording unknown bird calls |
| 1 | Celsius thermometer |
| 1 | GNSS unit and accompanying SOP for navigating to bird plots |
| 50 – 100 | 36-in. pin flags with 4 x 5 in. flag (florescent pink works well) |
| 2 – 3 | Sharpie or other permanent marker for marking plot numbers on pin flags |
|  | **Habitat work** |
| 1 | 5.0-m rope with attached surveying pin to mark subplot boundaries |
| 1 | 1.78-m rope with attached surveying pin to mark sampling plot boundaries |
| 8 | Surveyors pin for delineating the bounds of the 1.78-m sampling plots |
| 2 | 1.27-cm x 1-m PVC pipe for measuring slope |
| 1 | English clinometer for measuring slope |
| 1 | Metric clinometer for measuring tree height |
| 1 | Spherical densiometer for measuring canopy cover |
| 1 | Cruz-all (10 factor English) or Prizm (2.5 factor metric) |
| 1 | 0.15 x 2.0-m profile board |
| 1 | 7.5-m telescoping graduated measuring rod for measuring vertical structure |
| 1 | 5-m D-tape for measuring tree diameters |
| 2 | 50-m tapes (100-m tape may be substituted for one 50-m tape) |
|  | **Both elements of bird monitoring** |
| 2 | Compass for direction between plots and subplot and subplot aspects |
| 2 | Clip boards for recording data and carrying data sheet |
| 2 – 3 | Cruising vest for carrying equipment (backpack and hip packs may be substituted) |
| 2 | Two-way radios for communication between birder(s) and/or habitat crew(s) |
| Several | Reference books for bird and plant identification |
| Several | Insect repellent |
| Several | Sunscreen |
| 2 | First Aid kit |

Suggested reference manuals for bird surveys and habitat work:

* Bare, J. E. 1979. Wildflowers and Weeds of Kansas. The Regents Press of Kansas, Lawrence, KS. 509 pages.
* Dorm, R. D. 1992. Vascular Plants of Wyoming. Mountain West Publishing, Cheyenne, WY. 340 pages.
* Great Plains Flora Association. 1986. Flora of the Great Plains. University Press of Kansas, Lawrence, KS. 1402 pages.
* Hitchcock, A. S. 1971. Manual of the Grasses of the United States (volumes I-II), 2nd edition revised by A. Chase. Dover Publications, Inc., New York, NY. 1051 pages.
* HTLN reference book “Birds of ARPO, EFMO, GWCA, HEHO, HOCU, HOME, LIBO, PERI, PIPE, TAPR, and WICR”.
* HTLN reference book “Trees of ARPO, EFMO, GWCA, HEHO, HOCU, HOME, LIBO, PERI, PIPE, TAPR, and WICR”.
* James, D.A. and J.C. Neal. 1986. Arkansas Birds – Their Distribution and Abundance. The University of Arkansas Press, Fayetteville, Arkansas. 402 pp.
* Janssen, R.B., D.D. Tessen, and G. Kennedy. 2003. Birds of Minnesota and Wisconsin. Lone Pine Publishing International, Auburn, Washington. 376 pp.
* Mumford, R.E. and C.E. Keller. 1984. The Birds of Indiana. Indiana University Press, Bloomington. 376 pp.
* National Geographic. 1987. Field Guide to Birds of North America, 3rd Edition. National Geographic, Washington, D.C. 480 pages.
* Peterjohn, B.G. 2001. The Birds of Ohio: with the Ohio breeding bird atlas. The Wooster Book Company, Wooster, Ohio. 637pp.
* Robbins, C.S., B. Bruun, and H.S. Zim. 1983. Golden: A Guide to Field Identification of North American Birds. Western Publishing Company, Inc., Racine, WI. 360 pages.
* Robbins, M. B. and D. A. Easterla. 1992. Birds of Missouri: their distribution and abundance. University of Missouri Press, Columbia. 399 pp.
* Sharpe, R.S., W.R. Silcock, and J.G. Jorgensen. 2001. Birds of Nebraska: their distribution and temporal occurrence. University of Nebraska Press, Lincoln, Nebraska. 520pp.
* Spess-Jackson, L., C.A. Thompson, and J.J. Dinsmore. 1996. The Iowa Breeding Bird Atlas. University of Iowa Press, Iowa City. 484 pp.
* Stokes, D. W. and L. Q. Stokes. 1995. Stokes Field Guide to Birds: Western Region. Little, Brown and Company, New York, NY. 519 pages.
* Stokes, D. W. and L. Q. Stokes. 1995. Stokes Field Guide to Birds: Eastern Region. Little, Brown and Company, New York, NY. 471 pages.
* Stubbendieck J. and E. C. Conard. 1989. Common Legumes of the Great Plains: an illustrated guide. University of Nebraska Press, Lincoln, NE. 330 pages.
* Stubbendieck J., S. L. Hatch and C. H. Butterfield. 1992. North American Range Plants: 4th edition. University of Nebraska Press, Lincoln, NE. 493 pages.
* Thompson, M. C., C. A. Ely, B. Gress, C. Otte, S. T. Patti, D. Seibel, and E. A. Young. 2011. Birds of Kansas. University Press of Kansas, Lawrence. KS. 528pp.