



*A nonprofit organization  
dedicated to ornithological  
research, education and  
conservation.*

**BRADDOCK BAY BIRD OBSERVATORY**

---

## **MIGRATION MONITORING PROTOCOL**

**Standard guidelines for migration monitoring research at  
Braddock Bay Bird Observatory's  
Kaiser – Manitou Beach Research Station**

**Version 2.1 (October 1999, updated March 2002) by David Bonter  
Version 1 by Greg Jones**

Braddock Bay Bird Observatory's migration monitoring operations are designed to monitor the passage of landbirds during spring and fall migrations. Standardized migration monitoring methods and procedures are required to assure the comparability of data between and among years, and for the possible detection of long-term landbird population trends (Blancher *et al.* 1994). This manual establishes the standard migration monitoring protocol for the Kaiser-Manitou Beach Banding Station (KMB) of Braddock Bay Bird Observatory, Inc. (BBBO). The protocols set forth in this manual are designed to adhere to standards established by the Intensive Sites Technical Committee of the Migration Monitoring Council (Hagan *et al.* 1994, Hussell and Ralph 1996). Station operators should make every effort to ensure that the practices, standards and policies set forth in this manual are upheld. Any deviations from standard protocols must be documented.

#### Dates of Operation:

Intensive migration monitoring periods will be scheduled for each season of station operation. The intensive spring migration monitoring period shall begin by the last week of April and continue through the first week of June annually. The intensive fall migration monitoring period shall run from approximately September 1 to October 30 annually. During this intensive period, every effort should be made to follow all standards outlined in this document. Sampling outside of the established intensive monitoring periods may be conducted as approved by the Observatory's Research Committee. Operators are encouraged to follow the full station protocol during all monitoring periods, regardless of whether or not the intensive monitoring rules are in effect.

#### Station Set-up / Closing Protocol:

##### *Seasonally:*

The first and last days of each field season should be devoted to station set-up and closing, respectively. Station set-up involves the re-clearing of net lanes, placement of nets, and establishment of work areas for the season. Maintenance to the station grounds may be conducted at this time as well as throughout the field season as needed. Closing involves the removal of nets and poles, breakdown of work areas, and storage of equipment.

Operation under the full protocol requires a minimum of 20 standard mist nets (30mm mesh, 12 meter length is standard with 6 meter nets considered one-half net). The placement of nets 1 - 5 and 7 - 21 (see Appendix A) must be consistent within and between monitoring seasons. These nets have been established to adequately sample all habitat types. Additional nets (22 and 24 - 29) have been operated consistently since Fall 1998, are slated to become part of the full station protocol, and should be considered as

---

such. The remaining nets are "experimental" nets, which allows for some flexibility between seasons. For example, nets utilized for the aerial net project are experimental (40 – 90 series). However, every effort should be made to continue sampling in established net locations, experimental or otherwise. Any deviations from the established protocol must be recorded. Captures from experimental nets must be excluded from trend analyses.

Nets should be kept taut, and may require periodic resetting. Guy lines should be used where necessary to maintain net tension. Guy lines in high traffic areas should be marked with flagging tape. Vegetation must be trimmed to prevent net entanglement.

#### *Daily:*

When weather conditions permit, all nets should be opened by sunrise on each day of operation. Nets should remain open until at least the sixth full hour after sunrise, regardless of the number of birds present. Net checks should be made at half hour intervals, beginning 15 minutes after sunrise. Time between net checks should be reduced if weather conditions warrant, however disturbance of netting areas should always be minimized. Properly trained personnel must check nets. Visitors may have access to the educational nets (nets 1 - 6) only when accompanied by station personnel. Visitor access to the non-educational net lanes should be discouraged, and only allowed under the supervision of station personnel.

During periods of extreme weather conditions or high bird volume, only those nets that can be adequately operated by station personnel should be opened. Extreme weather conditions may include high wind, excessive heat or cold, or steady rain. Any unscheduled net closures due to such conditions must be recorded on the net hours data sheet.

In order to ensure that each net is open for a similar length of time daily, nets should be opened and closed in a consistent manner starting and ending with the same nets.

To prevent biasing the data, no artificial lures, feeders, or brush crashing will be permitted on station grounds during migration monitoring periods.

#### Processing Captured Birds:

Ensuring the safety and well being of all birds captured and banded at this station must be our top priority. In the event of unacceptable casualties or injuries resulting from predation, weather or high volumes, monitoring operations should be suspended. On busy days, workloads can be reduced by following the modified protocol for fall-out conditions, detailed in Appendix B.

Holding cages and bags must be clean and safe, without ragged edges or loose strings. Birds should be individually transported in cloth bags to the central banding location. On busy days, only conspecifics of non-aggressive species may be placed in holding bags together. Do not place aggressive species (woodpeckers, chickadees, vireos, grosbeaks) together in holding bags or cages. Do not place large birds or woodpeckers in holding cages. Shade and / or adequate cover must be provided for the

---

birds' protection. All processing equipment must be maintained in good working order and be of the highest quality possible. Scales should be calibrated hourly.

All banding personnel should strive to minimize holding time by processing birds in a first in/first out order. Priority processing may be provided to the smallest, most fragile birds, to large birds, and to locally nesting birds that may be brooding or feeding nestlings. Only qualified persons having had sufficient training, as deemed by master banding permit holders, should band and take measurements.

Recaptured birds should be processed in the same manner as new captures, with all data being collected on a standard data sheet labeled "recaptures." These data should be kept separate from those of first time captures. No reference should be made to previous measurement, aging or sexing data while reprocessing birds. Birds recaptured within two hours of initial banding should be released immediately without being reprocessed.

*Data Collection:*

A. Measurements:

The following measurements and capture information should be recorded for every captured bird and recorded on standard station data forms:

<b>Date:</b>	Date of capture.
<b>Hour After Sunrise (HAS):</b>	Time of capture recorded to the half hour after sunrise in which the net check was initiated. The first net check should take place at 15 minutes after sunrise. Birds captured in this net check will be labeled hour "0.5" (Table 1).
<b>Capture Location (Net):</b>	Number of the net where the bird was captured.
<b>Band Number:</b>	Aluminum leg band number.
<b>Species:</b>	Four-letter species code, using standard Bird Banding Laboratory notation. (Birds that cannot be identified must be released unbanded.)
<b>Age:</b>	Letter code, using standard Bird Banding Laboratory notation.
<b>How Aged:</b>	Number code identifying aging criteria (see data sheets).
<b>How Sexed:</b>	Number code identifying sexing criteria (see data sheets).
<b>Wing Length:</b>	Unflattened wing chord length, to the nearest mm. Measure from the "shoulder" to the tip of the longest primary. Do not record wing length if the longest primaries are worn or still growing.
<b>Tail Length (Optional):</b>	Tail length to the nearest mm. Only measure when retrices are fresh and unabraded.
<b>Tarsus Length (Optional):</b>	Tarsus length to the nearest 0.1 mm.
<b>Fat Score:</b>	Subcutaneous fat score based on the six point scale detailed in Table 2.

---

**Mass:** Body mass to the nearest 0.1 grams on a calibrated scale. Birds should be weighed with the band on.

**Comments:** Any physical abnormalities, and other optional data requested by staff researchers should be recorded in the comments column on the data sheet. Rare species or individuals with unusual characteristics should be photographed.

**Table 1: Hour after sunrise example for sunrise at 6:00.**

Net Check	Net Check Time	Hour After Sunrise
First	6:15	0.5
Second	6:45	1.0
....	....	....
Final	13:45	8.0

**Table 2: Fat Score Scale (from Helms and Drury, 1960).**

<i>Fat Class</i>	<i>Furculum</i>	<i>Abdomen</i>
0	No visible fat.	No visible fat.
1 (Formerly Trace)	Some fat visible, but region is still deeply concave.	Trace of visible fat.
2	Region filling with fat, but still concave.	Fat not covering, some small patches.
3	Filled.	Fat covering abdomen, not markedly mounded.
4	Filled, with some fat overflowing up interclavicles.	Mounded pad of fat becoming distended.
5	Convex, overflowing over length of furculum.	Greatly distended mound.

Standard methods for taking measurements and making observations are based on criteria provided by the Bird Banding Laboratory of the United States Department of the Interior, the Intensive Sites Technical Committee of the Migration Monitoring Council, and the Identification Guide to North American Birds (Pyle 1997). Additional methods and data collection procedures may be requested by station researchers. In the interest of consistent data collection, all scheduled banders-in-charge should meet to review measurement and data collection procedures prior to each monitoring season.

Data should be recorded on field data sheets as each bird is examined and processed. Banding data must be reviewed for errors by the bander-in-charge at the end of each day. Computerization (in a format compatible with the Observatory's data base) is the responsibility of the bander-in-charge or an agent assigned by the bander-in-charge. Computerization should be completed within one month of data collection, and submitted to the research committee's data base manager. All data should also be submitted on standardized paper forms.

---

B. Weather Data:

Since migration patterns and capture rates can be influenced considerably by weather, local weather conditions should be monitored on each day of operation. Record the following climatic conditions at **sunrise and again at four hours after sunrise**:

<b>Air Temperature :</b>	Degrees Celsius, recorded at the station.
<b>Wind Speed and Direction:</b>	Recorded at the station.
<b>Cloud Cover:</b>	Recorded at the station.
<b>Precipitation:</b>	Recorded at the station.
<b>Barometric Pressure :</b>	Recorded from the National Weather Service reports from Rochester.

Additional weather data (e.g. passage of fronts) may also be gathered from the national weather service and recorded on the weather data form.

C. Net Hour Data:

In order to quantify migration monitoring and sampling effort, the following net hour data should be recorded on a standard station data form:

<b>Opening Time :</b>	Time that the final net was opened.
<b>Closing Time :</b>	Time that the final net was closed.
<b>Total Hours :</b>	Total hours of operation (Closing Time - Opening Time).
<b>Total Nets:</b>	Total number of 12 meter nets in operation. Six meter nets are recorded as 0.5 nets.
<b>Total Net Hours :</b>	Multiply Total Hours by Total Nets.
<b>Nets Opened:</b>	List the nets that were operated.
<b>Protocol:</b>	Indicate whether or not the full protocol was followed. If not, give reason in comments.
<b>Personnel:</b>	List the personnel operating the station, beginning with the bander-in-charge.
<b>Comments:</b>	Note any unscheduled net closures etc.

---

### Habitat Maintenance:

As capture rates can be affected by habitat changes at the site, active habitat management should be employed to minimize the influence of succession on capture rates. Since sections of this site are presently comprised of early or mid-successional vegetation, significant habitat changes are inevitable in the absence of active management. The goal of this management will be to maintain a static early successional shrubby field habitat. This involves the removal of all tree saplings in the habitat management zone, which includes all of the field and the hedgerow bordering the north edge of the field. Shrub islands in the field should be maintained at their present locations, sizes and species compositions. The field should be mowed annually between mid-July and early August.

Due to the land ownership issues and the difficulties involved in halting secondary succession, habitats outside of the habitat maintenance zone may be unmanaged. Net lanes should be cleared as necessary before each season throughout the grounds. Yearly assessments of vegetative structure on station grounds should be made to aid management decisions and strategies.

### Personnel:

Properly trained and qualified staff must always be present during each banding session. A licensed bander must be designated as bander-in-charge on all days of operation. The bander-in-charge is ultimately responsible for maintaining the standards of station operation and data collection.

All personnel should be concerned with maintaining good public relations. Trainees should not operate in the public eye until they have developed the necessary skills. All visitors' questions should be directed to the bander-in-charge or a staff member assigned by the bander-in-charge.

Recruitment of new volunteers is encouraged. New volunteers, regardless of past experience, must receive proper training in the protocols and methods of Braddock Bay Bird Observatory. Activities of new volunteers should be closely monitored by an experienced bander. Volunteers should not be permitted to hold, band or extract birds without first being acquainted with station protocol (Miles 1996).

### Code of Ethics:

The station will operate with utmost consideration paid to the banders code of ethics (Appendix C).

---

Disposition of Data:

Data required by the Bird Banding Laboratory should be submitted within one month of the end of each migration monitoring season. Season totals should be published in the BBBO newsletter and on the BBBO web site. More in-depth analyses should be published in an annual migration monitoring review under the auspices of the Observatory's Occasional Paper Series. Publication of data from BBBO migration monitoring operations in scientific journals is encouraged.

Data collected by BBBO are copyrighted, and may be made available to outside researchers upon the completion of a research cooperation agreement (Appendix D), and at the discretion of the BBBO Board of Directors.

Procedures for Changing Field Protocols:

Established protocols should be maintained in the interest of consistency in data collection and comparability between and among seasons. Protocol adjustments required for new research programs must be approved by the BBBO research committee. All approved changes should be reflected in addenda to this document.

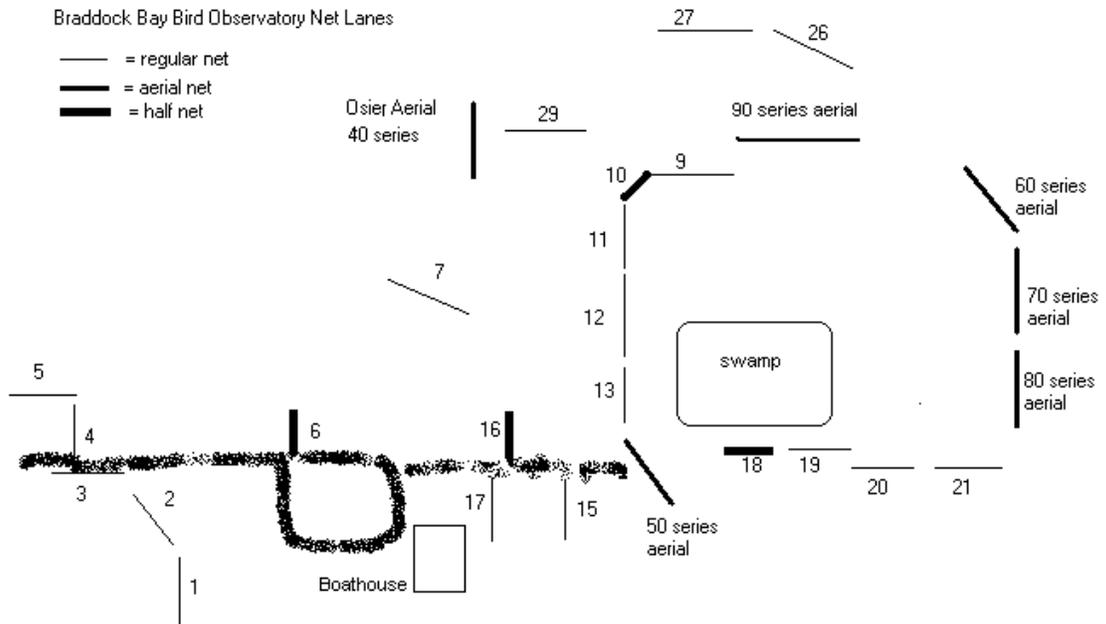
---

## LITERATURE CITED

- Blancher, P., A. Cyr, S. Droege, D. Hussell, and L. Thomas. 1994 . Results of a U.S. / Canada workshop on monitoring of landbirds during migration and recommendations towards a North American Migration Monitoring Program. 27 pp. [ Available from P. Blancher, Canadian Wildlife Service, National Wildlife Research Center, Hull, P.Q. K1A 0H3, Canada; or S. Droege, National Biological Survey 1849 C St. NW, Washington, D.C. 20240]
- Dunn, E and D. Hussell. 1995. Using migration counts to monitor landbird populations: review and evaluation of current status. In Power, D (ed), *Current Ornithology*, Vol 12, pp 43-88. Plenum Press, NY.
- Golden Gate Raptor Observatory. 1996. Bander's Manual, 3rd edition. [Available from Golden Gate Raptor Observatory, Building 201, Ft. Mason, San Francisco, CA 94123.]
- Helms, C. and W. Drury. 1960. Winter and migratory weight and fat studies on some North American buntings. *Bird Banding* 31: 1-40.
- Hussell, D.J. and C.J. Ralph. 1998. Recommended methods for monitoring bird populations by counting and capture of migrants. Intensive Sites Technical Committee of the Migration Monitoring Council.
- McCracken , J.D., D. Hussell, and E. Dunn. 1993 . A manual for monitoring bird migration . [Available from Long Point Bird Observatory, P.O. Box 160, Port Rowan, Ontario, Canada.]
- McCracken, J., L. Enright, D. Shepherd, J. Cappleman and E. Dunn. 1994. The Canadian Bander's Study Guide. [Available from Long Point Bird Observatory, PO Box 160, Port Rowan, Ontario, Canada N0E 1M0.]
- Miles, John B. 1996. A provisional manual for monitoring bird migration at Selkirk Provincial Park. [Available from John Miles, P.O. Box 449, Jarvis, Ontario, Canada NOA 1J0.]
- Pyle, Peter. 1997. *Identification Guide to North American Birds: Part I Columbidae to Ploceidae*. Bolinas, California: Slate Creek Press.
- Ralph , C.J. , G. Geupel, P. Pyle, T. Martin, and D. DeSante. 1993. Handbook of Field Methods for Monitoring Landbirds , Pacific Southwest Research Station , Albany , California . [Available from P.O. Box 245, Berkley , CA 94701-0245.]
- Ralph , C.J. , J. Sauer, S. Droege, eds. 1995 . Monitoring Bird Populations by Point Counts. Gen. Tech. Rep. PSW-GTR-149. Albany, C.A. Pacific Northwest Research Station , Forest Service , U.S. Dept. of Agriculture .
-

APPENDIX A.

**Net Lanes for Braddock Bay Bird Observatory  
Kaiser-Manitou Beach Station**



## APPENDIX B

### **Steps for Handling Fallout Conditions.**

**DO NOT “RING AND FLING”! It is better to record all data on 100 birds than minimal data on 400 birds. Do not hesitate to close nets if the volume is too high to record accurate data.**

1. Remember that ensuring the health and safety of the birds is the top priority.
2. Call for support.
3. If more birds are waiting than can be processed within an hour, eliminate measurements in the following order:
  - Tail
  - Tarsus
  - Fat
  - Age (use default AHY or U, depending upon season)
4. If birds are continuing to back-up after eliminating measurements, close nets as required in the following order:
  - back trail (including aerials 60 – 80 and nets 26 & 27)
  - all other aerials (40, 50, 90)
  - net 29
  - swamp trail (18 – 21)
  - nets 9 – 13
5. Record which nets were closed and at what time.

Make every effort to record as much data on each individual as possible. Mass and wing chord are particularly important.

---

## APPENDIX C:

### **Bander's Code of Ethics\***

Of primary importance, banders are responsible for the safety and welfare of the birds they handle:

- handle each bird carefully, gently, quietly, and with respect
- capture and process only as many birds as can be safely handled
- close traps or nets when there are known predators in the area
- do not band in inclement weather
- frequently assess the condition of traps and nets and keep them in good repair
- all personnel must be properly trained and supervised for the job they are doing
- check nets every 30 minutes, more often if deemed necessary
- properly close all nets at the end of the banding day
- do not leave nets set and unattended
- use the correct band size and banding pliers for each bird
- treat all bird injuries in the most humane way
- keep a list with the phone numbers/address of local rehabilitators
- properly supervise and monitor activities of station visitors.

Banders must always work to ensure that their own work is beyond reproach:

- reassess methods and approach whenever an injury or mortality occurs
- accept constructive criticism and suggestions from other banders.

Banders must do everything possible to ensure that data gathered are accurate and complete and that innovations in banding techniques and new information learned is shared with the scientific community.

The health and safety of workers and visitors to the banding station must be considered and proper precautions taken.

Cooperation between banders working at the station, both in on-site activities and publishing of data, must be ensured.

\* Adapted from several sources including McCracken *et al.* (1994) and Golden Gate Raptor Observatory (1996).

---

APPENDIX D:  
**Braddock Bay Bird Observatory  
Cooperative Research Agreement**

In order to foster data sharing, cooperative research and recognition of data collected at Braddock Bay Bird Observatory (BBBO) facilities, the BBBO Board of Directors has adopted the following policy. This policy must be read and signed by all cooperators working with BBBO data or at BBBO facilities.

1. Prospective researchers must submit a written abstract of their proposed research listing the purpose of the study and methods to be used. The BBBO Board of Directors must approve this proposal before research may begin.
2. Braddock Bay Bird Observatory requests that research proposals and papers being submitted for publication be reviewed by one or more members of the Observatory's Scientific/Academic Advisory Board.
3. Any researcher using Braddock Bay Bird Observatory facilities as a research site or existing data collected by Braddock Bay Bird Observatory will acknowledge BBBO in the appropriate section of their publication.
4. If any data collected by Braddock Bay Bird Observatory is transferred to another research entity, BBBO retains ownership of the data and the rights to review publications or reports produced.
5. One copy of any report (published or unpublished) produced from BBBO data or data collected at BBBO facilities will be sent to BBBO.
6. Researchers agree to comply with the ethical treatment of wild birds standards set forth by the Ornithological Council.
7. Researchers agree to consider submitting results for publication in the Observatory's Occasional Paper Series.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Affiliation: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

BBBO Representative Name: \_\_\_\_\_

BBBO Rep. Signature: \_\_\_\_\_ Date: \_\_\_\_\_

---