

D. FOUR IMPORTANT RULES TO REMEMBER

Now that you have a good general understanding of the entire MAPSPROG input/import/verification/editing procedure, we would like to provide four important rules to guide your use of the program. Please make sure that you thoroughly understand each of these rules and commit them to memory.

First, there are numerous complex steps involved in data verification. The best sequence of steps varies depending on your approach. The closer you follow the guidelines detailed in the *2006 MAPS Manual* and in this *MAPSPROG Version 4.1 Manual*, the fewer problems you will encounter. Many of the questions that arise in using MAPSPROG are addressed in the Manuals. If questions arise, check the appropriate sections in the two Manuals; answers may well be spelled out there. Contact IBP if questions persist or confusion arises.

Second, supplementary data (SK, CP, BP, F, BM, FM, FW, JP, WNG, WEIGHT) taken in the field **MUST NEVER BE CHANGED OR DELETED AT ANY TIME OR DURING ANY EDIT** (unless the erroneous supplementary data resulted from a data entry error).

Third, you do not necessarily have to make a change in the primary data fields (BAND, SPEC, AGE, HA, SEX, HS) should a within-record conflict arise. You should only change the determinations in these primary data fields when the weight of evidence indicates that the determination was in error. For example, consider a bird aged Hatching Year (HY) by juvenal plumage (JP="2"; HA="J"), that also was given a cloacal protuberance of "2." Because of the conflict between AGE="2" and CP="2," this record will be flagged in the within-record verification routine as a non-critical error. As always, the CP and JP designations must not be changed. The age of the bird, however, may be changed to unknown (JP="2" conflicts with CP="2"); changed to an After Hatching Year (AHY) bird (CP="2" is trusted more than JP="2," or additional molt, wear or skull information supports the AHY designation); or not changed at all (JP="2" is trusted more than CP="2," or additional molt, wear or skull information supports the HY designation). See the critical errors discussion in Section III of the *User's Guide* for further instruction in processing critical and non-critical errors.

Fourth, if a between-record discrepancy in SPEC or SEX is found, you must make a change in at least one of these fields to make the species and sexes identical and the ages consistent over the years of capture, or use the program to place a "?" in the N field of at least one of the conflicting records. Stated another way, you may not leave a between-record SEX discrepancy in your final verified and edited database unless a SPEC discrepancy also exists between the two conflicting records; and, furthermore, you may not leave a SPEC discrepancy in the final verified and edited database unless one or the other (or both) of the conflicting records has been marked with a "?". Remember that original determinations made in the field are never deleted; they are saved in the "Original" fields if a change is made (e.g., in-field sex determination is saved in OS [original SEX] if a change is made to SEX).

E. GENERAL PROCEDURES FOR USING MAPSPROG 4.1

This outline is an annotated reference on how to proceed with MAPSPROG. First-time users should work through the *Manual* in full, as it contains much important information. Experienced users may want to use a photocopy of this outline as a screen-side guide for their work with MAPSPROG. If you are not sure how to undertake instructions given in this outline, always check the section indicated in the main body of the *Manual* for details. Arrows indicate instructions for special situations in the body of the *Manual*, and are cross-referenced with the text boxes in the left margin of the section of the *Manual* indicated.

I Introduction (see p. 15)

- A. Read the *User's Guide* and the Introduction to the *User's Manual*.
- B. Become familiar with the RAWMAPS/TEMPMAPS/NEWMAPS files and the MAPSPROG Utilities.
- C. Learn the four important rules of MAPSPROG.

II Getting Started (see p. 37)

- A. Check the hardware/software requirements for running MAPSPROG (*Getting Started*, section A).
 - MAPSPROG will not run on 64-bit systems.
 - MAPSPROG is designed for Windows PCs, but will run on Mac (and Linux?) machines with PC-simulating software, e.g., Virtual PC.
- B. Install the program: close programs, insert disk 1 (or the CD), type "A:\SETUP" (or "E:\SETUP", where E:\ is the CD-ROM Drive) in Windows' "Run" window, assign a directory, and follow on-screen instructions (*Getting Started*, section B).
 - IDAPI applications conflicts.
- C. Check your default Windows printer; set "Caps Lock" on (*Getting Started*, section C).
 - Canadian users: adjust computer date settings to US conventions.
 - Program Alerts.
- D. Become familiar with the main screen, the drop-down menus, and how to move about the screen using the keyboard and mouse (*Getting Started*, section D).
 - Inaccessible ("grayed-out") menu headers or menu options.
- E. Decide whether to enter data directly into RAWMAPS or to import data from another program (*Getting Started*, section D).

III Banding Data Entry (see p. 41)

- A. Enter Location code and year of the data you are entering (*Banding Data Entry*, section A).
 - Append to or replace data in RAWMAPS? (see also Introduction to *Manual*)
 - Enter and conduct within-record verification on only one year of data at a time.
 - Creating a station list.
- B. Enter data record by record into RAWMAPS (*Banding Data Entry*, section B).
 - New "Swab" data field in 2006.
 - New data entry feature in Version 3.8.
 - Read Important Notes on data entry in *Manual* or in Information box on-screen.
 - Beginning with Version 4.0, the 'NET' field can not be blank.

- Saving your work.
 - Data entry screen buttons and the “browse” mode.
 - Problem with entering WEIGHT.
 - Entering data from multiple locations.
 - Interrupting data entry.
 - Entering non-MAPS data.
- C. Proof your data entry against the raw banding sheets (*Banding Data Entry*, section C).
1. Print the data entered.
 - What to do about incomplete (three-letter) species codes on the print-out.
 2. Carefully compare the print-out with your raw data sheets and mark *any* differences.
 3. Correct your data in “browse” mode; enter missing records in data entry mode and delete duplicate or extra records with the “Delete a record in RAWMAPS” function.
- D. Check the banding dates in the data entered against your Summary of Effort sheets (*Banding Data Entry*, section D).
- Check for records with improperly recorded dates or stations and for records without a date or station and correct them.
- E. Check the capture numbers in the data entered against your Summary of Results sheets (*Banding Data Entry*, section E).
- Check for discrepancies between capture totals in RAWMAPS and your summaries to find missing records to enter or extraneous records to delete.
- F. Transfer data to TEMPMAPS (*Banding Data Entry*, section E).
- Append to or replace data in TEMPMAPS? (see also Introduction to *Manual*)

IV Banding Data Importation (see p. 53)

- A. Prepare database file for importation into MAPSPROG (*Banding Data Importation*; see also box “Making Global Changes” in “Within-Record Verification of TEMPMAPS, section B).
- Append to or replace data in RAWMAPS? (see also Introduction to *Manual*)
 - Import and conduct within-record verification on only one year at a time.
 - Importing files with multiple locations.
 - Importing non-MAPS data.
- B. Import data (*Banding Data Importation*).
1. Importing dBASE or FOXPRO files; files must be in the exact structure given in Appendix I of the *Manual*.
 2. Importing ASCII delimited files; using the “Import Criteria” box, you can assign the fields from your database that you want to import into RAWMAPS.
 - Saving import criteria for future data file imports.
 3. Importing SDF files; files must be in the exact structure given in Appendix I of the *Manual*.
 - Must use the structure in Appendix I for data from any year.
 - Read Important Notes on data entry in *Banding Data Entry*.
 - Marking records not captured at MAPS nets or station.
 - Marking records with uncertain species (see box in *Banding Data Entry*).
 - Creating a station list.

C. The remaining steps C to F are as for II, Banding Data Entry.

V Effort Data (see p. 57)

- A. Enter effort data (*Effort Data*, Section A).
- How to enter effort data for multiple years (see also Introduction to *Manual*).
 - 1. Enter the location, station, and year for which you are entering effort data.
 - 2. Indicate if station experienced a one- or two-period shift in starting period in the year for which you are entering data.
 - Possible only in the higher elevations of the western mountains where snowpack may delay breeding phenology.
 - How to shift by Intended Period versus entire season.
 - How to decide whether to shift or not.
 - See box “Shifting Effort by Intended Period”
 - 3. Create a station net list by entering the number of net sites and the precise net designations. If you have entered a net list for this station previously, you must double-check the net list.
 - How to determine net designations for stacked nets, nets of irregular length, changed nets, etc.
 - Match net designations in net list exactly to net designations in banding data.
 - Adding and deleting nets.
 - How to adjust the list of net designations when net sites change.
 - 4. Enter the Intended Period, Sub-period, Date, Open and Close Times for a single banding day as they appear on your Summary of Effort sheet. The program checks entries for validity once you click “Create Records.”
 - Determining Intended Period (IP) — when effort for a given Period does not fall within the 10 days of that Period.
 - Assigning Sub-Periods — when nets are operated more than once per IP.
 - Handling records collected outside of regular MAPS operations.
 - Assigning opening and closing times for nets opened or closed together.
 - Assigning opening and closing times for nets opened or closed late or early.
 - Entering effort for nets opened and closed more than once in one day.
 - Do not enter any effort for a given IP if no nets were run.
 - 5. The program displays a net-by-net listing of opening and closing times for the Intended Period and Sub-period that you have designated. Ensure that the list created matches your Summary of Mist-Netting Effort Sheet; make any necessary corrections. The program calculates the total number of net-hours operated for the Intended Period and Sub-period entered. Ensure this total matches the totals you calculated on your Summary of Effort Sheet.
 - 6. Once the effort hours match, the effort data are saved for further processing. You may enter effort data for another banding day or proceed with effort data proofing.
- B. Proof your effort data against your Summary of Effort Sheet (*Effort Data*, Section B).
- 1. Print your effort data.
 - 2. Carefully compare the print-out with your Summary of Effort Sheet.
 - 3. Correct your data in “browse” mode.
 - Deleting and adding records.

- C. Verify effort data. The program compares the banding data in TEMPMAAPS to the effort data you entered. This step can be undertaken for all data from a season at once or for just a small number of banding days (*Effort Data*, Section C).
- Process effort data only after banding data have been transferred to TEMPMAAPS.
 - 1. MAPSPROG first checks that the location code(s) entered in the effort data match the location code(s) in TEMPMAAPS.
 - How to perform a global replace of invalid location code(s) in TEMPEFF or TEMPMAAPS.
 - 2. The program checks for blank nets in the banding file, and requires operators to enter either '?' (unknown MAPS net) or 'NM' (non-MAPS net) in the 'NET' field of all records with blank nets.
 - 3. The program checks for dates between April 21-30 and August 9-28 and asks operators to indicate whether MAPS effort was conducted on these dates.
 - 4. The program checks that all banding records in TEMPMAAPS have an effort record indicating that the net given was run at the given station on the given date.
 - How to correct banding or effort records if the files do not correspond.
 - 5. The program checks for effort from stations that were listed in the station list (created during banding data entry) as non-MAPS.
 - 6. The program checks that all banding records in TEMPMAAPS were captured between the opening and closing times given in the effort file for that net.
 - Correcting banding or effort records, or marking records with capture times outside normal MAPS operation for that station.
- D. Create a final effort file for submission to IBP once you have entered and verified all your effort data for the season(s). Once you finish working with MAPSPROG, you will create a diskette to send to IBP that includes this file in compressed form (*Effort Data*, Section D).

VI Within-Record Verification of TEMPMAAPS (see p. 73)

- A. Review the within-record verification concepts, including making corrections only in TEMPMAAPS so that errors can be properly tracked; changing primary data only, **not** supplemental data; and the distinction between critical vs. non-critical errors (*Within-record Verification*, section A).
- Versions 4.0 and above allow entry and verification of year-round banding data.
- B. Verify within-record consistency of records (*Within-record Verification*, section B).
1. Display messages identifying ways data collection techniques could be improved.
 2. Check for valid codes and perform global replaces.
 - a. Check the number of locations in TEMPMAAPS and allow global replaces of misentered location codes.
 - b. Locate and allow global replaces of invalid location and/or station code(s).
 - c. Check the number of stations in TEMPMAAPS and allow global replaces of misentered station codes.
 - d. Replace band size with "R" for recaptures and "U" for unbanded birds.
 - e. Locate and allow global replaces of blank Band Size codes.
 - f. Locate and allow global replaces of invalid Band Size codes.
 - g. Locate and allow global replaces of invalid Band Size / band string combinations.

- h. Replace invalid code of '9' with blank in SK, CP, BP, F, BM, FM, FW, & JP.
 - i. Replace invalid FM code '0' with 'N'.
 - j. Replace invalid status code(s).
 - k. Locate and allow global replaces of invalid time code(s).
 - l. Locate and allow global replaces of invalid FP code(s).
3. Run the within-record verification routine. The program generates a list of error and warning messages for all other critical errors and non-critical discrepancies. View the lists of error and warning messages both in summary form and record-by-record on the screen and/or by printing.
 - MAPSPROG checks that banding data from 2003 or subsequent years were entered using species alpha codes from Pyle and DeSante (2003, 2005), and converts codes as necessary.
 - List is stored until you re-run verification routine.
 - How to make sense of the messages.
 - Using your database application to make global changes to your data if you need to replace additional codes (see box "Making Global Changes").
 4. When you process TEMPMAPS for within-record consistency, each record with an error or discrepancy is presented for review automatically. Address each message, record-by-record, and correct all critical errors (invalid codes and critical discrepancies); correct any non-critical discrepancies in need of correction and suppress the others. MAPSPROG will not allow you to proceed until all critical errors have been purged.
 - How to retrieve records as originally entered.
 - How to interrupt within-record processing.
 5. Edit records in TEMPMAPS by record number if you need to access specific records. Record numbers appear in the browse windows and the effort verification print-outs.
 6. Add records to TEMPMAPS if necessary.
 - How to process miscoded mortalities.
 7. Transfer data to NEWMAPS.
 - Ages, sexes, and Molt Limit & Plumage codes are checked against information from the bar graphs in Peter Pyle's *Identification Guide to North American Birds, Part I* to ensure accuracy and validity of codes.
 - Append to or replace data in NEWMAPS? (see also Introduction to *Manual*)
 - If append is selected and TEMPMAPS contains data from 2003 or subsequent years, MAPSPROG will convert all species alpha codes in NEWMAPS to match those described in Pyle and DeSante (2003, 2005) before transferring data.

VII Between-Record Verification of NEWMAPS (see p. 87)

- A. Review concepts of between-record consistency, including the need to compare all capture records for an individual band number; the meaning of "consistency" for Code, Species, Sex, and Age; the possibility of misread band numbers and what can be done about them; the approach to making records consistent; and how to handle unresolvable conflicts between records (*Between-record Verification*, section A; see

also the box “Guidelines Governing Between-record Verification Editing” in section B.5, and sections III and IV of the *User's Guide*).

→ What if there are AGE or SEX conflicts between new and older, verified records?

- B. Run between-record verification (*Between-record Verification*, section B).
 1. Append data files from previous years. You can run between-record verification at any time with any amount of data in NEWMAPS, but it must be run a final time with a complete MAPS data file for your location.
 - a. If verifying data from 2003 or subsequent years, MAPSPROG will convert all species alpha codes in the imported file to match those described in Pyle and DeSante (2003, 2005), after importing data.
 - b. MAPSPROG then checks that the location code(s) in the file to be appended match the location code(s) in NEWMAPS.
 - How to perform a global replace of invalid location code(s) in the file to be appended or in NEWMAPS.
 - c. You can append a cumulative verified data file including data from all previous years sent to you by IBP, or. . .
 - d. . . you can append unverified data from multiple years if you have unverified data from previous years (for more guidance, see Introduction to *Manual*).
 2. Process any changed and added bands in the data you transferred to NEWMAPS. Enter old and new band numbers for changed bands and the two band numbers for added bands; the program will adjust the records appropriately. If there are neither changed nor added bands in NEWMAPS, proceed to 3.
 - Make sure there are an even number of changed and/or added band records.
 - How are added bands entered into MAPSPROG?
 - What does the program do with these records?
 - Make sure all records for changed and added bands are properly recorded.
 3. Check all records for which there are only recaptures in the data file. Produce a list of band numbers that have no “N”-coded record. Compare the list of band numbers generated against band numbers in your banding schedules and band inventory; band numbers not accounted for may represent foreign recoveries or misread band numbers. Use the band number finder to identify possible original records for misread band numbers. Correct any numbers found to be in error or mark them as questionable.
 - See discussion of band number finder in box “Dealing with Misread Band Numbers” in section A, *Preview*.
 - Run the “List bandnumbers for which there are only recaptures” step a second time to confirm that you have checked for misread band numbers.
 4. Check all recaptures that predate their original banding record. Produce a list of band numbers for which recaptures predate their original banding record and identify the source of the problem by checking raw data sheets and your band inventory. These problems may be misread band numbers. Use the band number finder to identify possible original records for misread band numbers. Correct erroneous band numbers or dates or mark the records as questionable.
 - See discussion of band number finder in box “Dealing with Misread Band Numbers” in section A, *Preview*.

5. Run the between-record consistency routine. MAPSPROG generates a list of error messages for all discrepancies in C (code), SPEC, SEX, STATUS or STATION in records sharing the same band number. View the list of error messages both in summary form and by band number. Print the individual list of band numbers for reference.
 - Many between-record AGE inconsistencies automatically resolved in Versions 4.0 and above.
 - Ages must be consistent within and between years in Versions 4.0 and above.
 - a. Each of the band numbers on the list must be entered into the “Edit” screen for verification.
 - Enter leading zeros for eight-digit band numbers.
 - Rearrange fields in browse window to facilitate data comparison.
 - b. Address all of the between-record error messages and make changes to primary data fields, comparing data for all records sharing a band number (see step-by-step guide to between-record verification in *Between-record Verification*, section B.5).
 - How to go about conflict resolution.
 - See box “Guidelines Governing Between-record Verification Editing.”
 - Saving changes.
 - Dealing with duplicate records.
 - See discussion of band number finder in box “Dealing with Misread Band Numbers” in section A, *Preview*.
 - When changes are made, in-field determinations are stored in “Original” fields (e.g., OSPEC).
 - What is the meaning of “R” in the fields HA and HS?
 - Other possible conflicts detected by between-record verification.
 - Resolving species or sex for previously marked records.
 - c. Re-verify all records sharing a band number until all between-record discrepancies have been addressed and purged (except for valid station and status changes and except between marked records).
 6. Mark any records for which the species or band number remain questionable with a question mark in the N field.
 - Note band numbers of such records on your field sheets, so that the bird with the band in question can be scrutinized for species, age, and sex during subsequent recaptures.
 - Saving changes.
 - See discussion of band number finder in box “Dealing with Misread Band Numbers” in section A, *Preview*.
 7. View the records in NEWMAPS (“View / Browse records in NEWMAPS”) to determine which data is already included in the file.
 8. Delete any duplicate records from NEWMAPS; be sure to click the “Return to Main Menu” button to exit the “Delete” screen.
- C. Create a final verified banding data file for IBP and for your own use; save the files.
- Choose whether or not to submit non-MAPS data to IBP.

VIII Breeding Status List Data (see p. 105)

- A. Preview and general outline of breeding status module procedure.
 - Why collect and verify breeding status data?
 - Estimate breeding status within your station boundary.
- B. Enter breeding status data.
 - Entering breeding status data for multiple years.
 - Entering breeding status data for multiple locations and/or stations.
 - Either enter breeding status data by Intended Period or in Spreadsheet View
1. Ensure that TEMPSN contains breeding status data from all previous years of station operation.
2. Enter by Intended Period:
 - a. Enter the location, station and year of the breeding status data to be processed.
 - MAPSPROG first checks that the location code matches that entered previously in the breeding status file, and asks if you want to change the new or existing location code.
 - b. Enter the first Intended Period (IP) of the breeding status data to be processed.
 - Determining Intended Period.
 - c. Enter Period Breeding Status codes for each species encountered.
 - If there is no previous breeding status information on file, you will need to enter each four-letter species alpha code.
 - See Appendix "Unidentified Species Alpha Codes."
 - Where to find descriptions of Period Status codes.
 - What if I make an entry error?
 - d. Enter species alpha codes and Period Status codes for new species.
 - e. Enter Period Status codes for all Intended Periods operated.
 - If TEMPSN contains data from 2003 or subsequent years, MAPSPROG will convert all species alpha codes in the file to match those described in Pyle and DeSante (2003, 2005).
3. Enter breeding status data in Spreadsheet View.
 - Enter all records for a station and year in a format resembling the BSL sheet.
- a. Enter the location, station and year of the breeding status data to be processed.
 - MAPSPROG first checks that the location code matches that entered previously in the breeding status file, and asks if you want to change the new or existing location code.
- b. Enter species alpha codes and Primary and Secondary Period Breeding Status codes for each species encountered, for each Intended Period completed.
 - If there is no previous breeding status information on file, you will need to enter each four-letter species alpha code.
 - Where to find descriptions of Period Status codes.
 - Navigating within the spreadsheet.
 - See Appendix "Unidentified Species Alpha Codes."
 - Adding or deleting records.
 - Enter species alpha codes and Period Status codes for all species and Intended Periods.
 - Correcting entry errors.

- If TEMPSN contains data from 2003 or subsequent years, MAPSPROG will convert all species alpha codes in the file to match those described in Pyle and DeSante (2003, 2005).
- C. Process new species (if any) for previous years of operation.
 - Do this only if you encounter new species not seen or banded in previous years.
 - Where to find Year Status code definitions.
 - Saving status code changes.
- D. Verify breeding status data against the banding data.
 - Banding and effort data must be entered and verified before completing this step!
 - MAPSPROG first checks that the location code(s) entered in the breeding status data match the location code(s) in NEWMAPS.
 - How to perform a global replace of invalid location code(s) in TEMPSN or NEWMAPS.
 - Add missing species to status file.
 - Add/remove "Ob" records to the status file.
 - Assign Year Status codes of "B" based on recapture data.
 - See box: "Determining Breeder Status by Recapture Information."
- E. Determine Year Status codes.
 - Why determine year status?
 - Check for migrant / non-migrant conflicts.
 - Check for Altitudinal Disperser conflicts.
 - Read Important Notes for Determining Year Status Codes.
- F. Edit or delete breeding status records by species.
 - This step may be completed at any time after daily breeding status data entry.
 - Delete all breeding status records for a species.
 - View and edit all breeding status records for a species.
- G. Print breeding status data for proofing.
- H. Create a final breeding status file to submit to IBP.
 - Check that all species at a station have breeding status records for all years that station operated.

IX Habitat Structure Assessment Data (see p. 131)

- A. Preview and general outline of habitat module procedure.
 - Why enter and verify Habitat Structure Assessment data?
 - Assess habitat structure within your station boundary.
 - Hierarchical nature of Habitat Structure Assessment protocol.
- B. Enter Station-specific data.
 1. Enter location, station, and year for which you are entering HSA data.
 - MAPSPROG first checks that the location code matches that entered previously in the HSA file, and asks if you want to change the new or existing location code.
 - If you entered HSA data for this station in a previous year, MAPSPROG will display the previous year's data in the HSA Entry Screens. Check and update this year's information as needed by simply entering any changes from the previous year's data.
 2. Select number of habitats.

- Delineating habitats within your station.
- 3. Enter cover and pattern of habitat(s).
 - Determining percent cover.
 - Determining spatial pattern.
- C. Enter data for the dominant habitat.
 - Enter data in order of decreasing habitat dominance.
 - 1. Enter data on HSA Entry Screen One.
 - Note on National Vegetation Classification Standard alliances.
 - Enter vegetation height in meters.
 - Cover Classes vs. Percent Cover.
 - Evaluate each vegetative layer independently.
 - Use scientific names when entering Main Species.
 - 2. Enter data on HSA Entry Screen Two.
 - Indicate the type of non-vegetative features present in the habitat.
 - Ground cover (Live, Dead, and Non-vegetative) must total 100%.
 - 3. Enter data on HSA Entry Screen Three.
 - Indicate the type of Human-made Corridors and Structures present.
 - Cover of all non-vegetative features combined should total no more than the percent cover listed in the "Total non-vegetative" field.
 - Write General Description of habitat.
 - Write Management/Disturbance History.
 - Saving, changing, or adding HSA data.
- D. Enter data for sub-dominant and minor habitats (if present).
- E. Change the number or pattern of habitats.
 - This step may be completed at any time after the number and pattern of habitats at the station have been entered.
 - Percents must total 100%, and patterns must be complementary.
- F. Print HSA data for proofing.
- G. Create a final habitat file to submit to IBP.

X Submitting Verified Data Files to IBP (see p. 147)

Selecting "Copy files for IBP to disk" in the "Utilities" menu zips and copies all dBASE files needed by IBP to a file called <LOCA><YEAR>.ZIP, which it saves to the disk drive of your choice. The diskettes can be sent; relatively small files can be emailed. For addresses, see final section (*Submitting Verified Data Files*).