Work Term Report II

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Table of Contents

1.0 Summary

This work term was completed under the supervision of Dr. Edward (Ted) Miller in the Biology Department at Memorial University of Newfoundland. Assigned duties included literature search and compilations to comprehend concepts related to animal communication, the organization and maintenance of recordings of *Gallinago gallinago* (Common Snipe) and *Gallinago delicata* (Wilson's Snipe), the characterization of the "drumming" sound produced by male *Gallinago delicata* and measuring the vocal tracts of Strigiformes specimens. Other duties completed include dissections of various avian specimens, cleaning *Lynx Canadensis subsolanus* skulls and cleaning *Canis latrans* penises. Unfortunately, not all duties were completed.

Basic temporal measures of Wilson's Snipe drum recordings were analyzed. Both the drum durations and durations of five pulses, i.e. the 7^{th} to the 3^{rd} pulse from the end of the drum, followed a near normal distribution. Trends suggested that little variation occurred in these variables within the species, regardless of their geographic location. Unfortunately, inter-drum intervals proved to be a less than ideal measurement to characterize the drum of Wilson's Snipe. Further, an insufficient number of vocal tracts of Strigiformes were measured to produce visible trends and accurate statistics. Recommendations for future directions include focusing on the completion of the required measurements and analyses to compare data collected to other species.

All but one of the personal objectives set at the beginning of the work term were fulfilled. How the successfully completed objectives were fulfilled throughout the work term is examined. A detailed analysis of why the objective of exploring the region of St

John's, Newfoundland was unfulfilled is also provided. An assessment of personal development and performance focuses on the effects of living in a new place. Additionally, observations of the workplace regarding relationships within and outside the office with supervisors and co-workers, office politics, the important of self-confidence and assertiveness and other aspects of the work environment are presented. A comparison of work styles between the workplace and academic setting is also made.

The work term was of an appropriate difficulty level based on skills and previous experience. However, future co-op students should consider a similar work term only if they possess adequate background knowledge on birds and understand the physics concepts related to sound. Nevertheless, both academic and personal aspects of this work term exceeded expectations. Not only will the research experience and skills acquired contribute to my future career success, but also the lessons learned about living in a new place will help better prepare myself for future work terms.

2.0 General Information About the Hiring Organization

2.1 Memorial University of Newfoundland

Memorial University of Newfoundland is the largest university in Atlantic Canada, with campuses in St. John's & Corner Brook, Newfoundland and a campus in Harlow, England. The university receives over $110 million in research grants and awards per year for researchers in 13 faculties and schools (Memorial University of Newfoundland, 2012). Memorial currently serves over 19,000 full- and part-time students, and 4,000 faculty and staff. Research at Memorial University acknowledges the special obligation to the people of Newfoundland and Labrador, and the importance of building capacity for research excellence that is both locally relevant and internationally significant (Memorial University of Newfoundland, 2010). Strategic Research Themes identify Memorial's priorities and strengths, which includes areas such as arctic and northern regions, and oceans, fisheries and aquaculture.

2.2 Biology Department

With over 100 graduate students, the Biology Department has one of the largest graduate programs at Memorial University of Newfoundland. More than 30 full-time faculty members conduct research on living systems at the molecular, cellular, physiological, organismal and ecosystem levels. Faculty members collectively work towards increasing the understanding of life processes within humans and others species, relationships within and among the species and to the environment, and their significance to the provincial, national and global community. The department is also committed to excellence in teaching and scholarship.

2.3 Dr. Edward (Ted) Miller & Laboratory

Dr. Edward (Ted) Miller is a professor in the Biology Department at Memorial University of Newfoundland. As a principal investigator, Dr. Miller has been involved in research on the biology of seals, shorebirds and woodpeckers, bioacoustics, quantitative ethology, speciation, morphometrics, and sexual selection. His recent work has been focused on acoustic communication in shorebirds, particularly the structure, variation, repertoire organization, geographic variation, phylogeny and evolutionary trends in bird sounds. Additionally, he has been investigating the vocal-tract anatomy of non-passerine birds. This investigation has focused on the sexual dimorphism, and allometry of vocal-tract size in Strigiformes and Falconiformes. Dr. Miller was the primary supervisor for the work term.

Dr. Miller conducts research with volunteers, and undergraduate and graduate students. Current members of his laboratory include M.Sc. students Jessica Flight, Doug Hynes, Chelsey Lawrence and Stephanie Leger, honours students Justin Strong, Bob Rogers and Carissa Currie, and multiple undergraduate volunteers. Studies conducted focus on the importance of mammals including seals, sea otters, coyotes and lynxes, and a wide variety of birds in the Newfoundland and Labrador region. Funding for this work term was provided by a Natural Sciences and Engineering Research Council of Canada (NSERC) Undergraduate Student Research Award (USRA) awarded to myself by the Biology Department at Memorial University of Newfoundland. The work term duties described below were assigned not only to meet the expectations of this award, but also to strengthen and develop the research conducted by Dr. Miller and the members of his laboratory.

3.0 Background Information on Birds

3.1 Bird Vocalizations

The syrinx is a very special sound-producing organ in birds (Figure 1) (Greenewalt, 1968; Gill, 1990; Proctor & Lynch, 1993; Catchpole & Slater, 1995). It is equivalent to the human voice box or larynx. The syrinx operates with nearly 100 percent physical efficiency to create loud, complex sounds and can produce two independent songs simultaneously. It is located in the body cavity at the junction of the trachea and the two primary bronchi. Sound is caused by the vibration of the air column as air passes through the syringeal passageway. Specific muscles, logically called syringeal muscles, control syrinx action during song production. Most nonpasserine birds have two pairs of narrow muscles on the side of the trachea above the syrinx; these muscles are called extrinsic muscles because they originate outside the syrinx.

Figure 1. A ventral view (left) and dorsal view (right) of a stained syrinx of a *Uria aalge* (Common Murre). Photo courtesy of Edward Miller.

3.2 *Gallinago*

Gallinago is a genus of birds in the wader family Scolopacidae containing 16 species (Tuck & Northeast Wildlife Conference, 1965; Sibley, 2000). Morphologically, they are all similar, with a very long slender bill and cryptic plumage. Most have distinctive displays, usually given at dawn or dusk. The male performs a "winnowing" display during courtship, flying high in circles and then taking shallow dives to produce a "drumming" sound by vibrating its tail feathers. The outer tail feathers are greatly modified to produce the sound and are thin and curved. This sound is a hallow "hu-hu-hu" sound and has been compared to the bleating of a sheep or goat.

The two species used during this investigation, *Gallinago gallinago* (Common Snipe) of Eurasia and *Gallinago delicata* (Wilson's Snipe) of North America, were previously considered the same species. Wilson's Snipe is now considered a subspecies of the Common Snipe. They differ in the number of tail feathers: seven pairs in *G. gallinago* and eight pairs in *G. delicata* (Mueller, American Ornithologists' Union, Cornell University & Academy of Natural Sciences of Philadelphia, 1999; Sibley, 2000). Wilson's Snipe also have a slightly thinner white trailing edge to the wings (Figure 2).

Figure 2. *Gallinago gallinago* (Common Snipe). Photo courtesy of Edward Miller.

3.3 Strigiformes

The owls form an easily defined group of chiefly nocturnal birds, classified as the order Strigiformes (Gill, 1990; Proctor & Lynch, 1993; Sibley, 2000). All owls have a rather large, rounded head, with forward facing eyes and soft, often cryptically coloured plumage. The curved bill with its pointed tip and powerful talons with sharp claws are similar to those of birds of prey. Owls have a caeca, but no crop. When perched, owls exhibit an upright posture. Many species have so-called “ear-tufts” – elongated feathers on the sides of the forehead. These play a behavioural role, primarily for camouflage, but have nothing to do with hearing. The true ears are openings situated at the sides of the head behind the rim of the facial disc. Owls do not exhibit distinct regional “dialects”; all vocalizations are inherited. Bioacoustic indications are thus among the most important taxonomic criteria used to distinguish species groups that are otherwise difficult to separate.

4.0 Detailed Description of Duties and Techniques Used

4.1 Comprehension of Concepts Related to Animal Communication, Particularly Sound Production By Birds Through Literature Searches and Compilations

Literature searches and compilations were conducted using Google Scholar® and the Queen Elizabeth II Library at Memorial University of Newfoundland to comprehend concepts related to animal communication, particularly sound production by birds. Over 25 books and 10 scientific papers were gathered and read. The key authors of books and papers about bird song were Dr. Donald E. Kroodsma from the University of Massachusetts Amherst in Amherst, Massachusetts, the late Dr. Luis F. Baptista and supervisor Dr. Edward (Ted) Miller. The key author of papers about the vocal apparatus of birds was the late Dr. Alden H. Miller. Relevant articles were published as early as 1934, however the majority of articles and books were published during the 1990s.

4.2 Organization and Maintenance of Recordings of *Gallinago gallinago* (Common Snipe) and *Gallinago delicata* (Wilson's Snipe)

Digital recordings of *Gallinago gallinago* (Common Snipe) and *Gallinago delicata* (Wilson's Snipe) were collected from the following online databases: the Macaulay Library from the Cornell Lab of Ornithology, the Borror Laboratory of Bioacoustics archive from Ohio State University, the Sound & Moving Image Catalogue from the British Library, Xeno-canto maintained by Willem-Pier Vellinga and Bob Planqué and the Avian Vocalizations Center (AVoCet) from Michigan State University. Recordings were also taken from Dr. Edward (Ted) Miller's personal collection, the Florida Museum of Natural History, Dr. Rob Rempel's personal collection and from Neville Recordings. Over 400 recordings of Wilson's Snipe and 230 recordings of

Common Snipe were collected from across Canada and the United States of America (Figure 3). A list of these recordings is included in Appendix I.

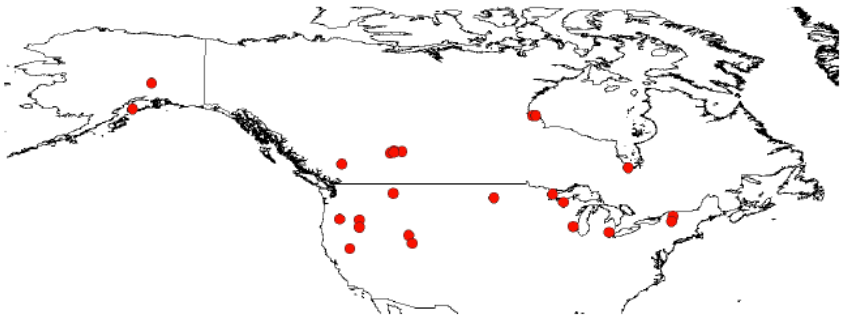

Figure 3. Geographic location of the 400 recordings of *Gallinago delicata* (Wilson's Snipe) collected.

4.3 Raven, Praat and Statistical R Skills Developed to Analyze Drum Recordings of *Gallinago delicata* (Wilson's Snipe)

The Cornell Lab of Ornithology program called Raven (2011) was used during the work term to analyze drum recordings of *Gallinago delicata* (Wilson's Snipe). The Raven 1.4 User's Manual was used to introduce the major features of the interactive sound analysis software (Charif, Strickman, & Waack, 2010). The program called Praat (2013) was also used to analyze drum recordings of Wilson's Snipe. The introductory tutorial included in the software was used to familiarize the user with the spectral analysis and pitch analysis features. Further details about how these analysis programs were used is included in section 4.4. The use of the R (2012) package called Seewave was considered to conduct the analysis of drum recordings (Sueur, Aubin, & Simonis, 2008). Seewave was not used because the documentation was severely lacking.

4.4 Characterization of the "Drumming" Sound Produced by male *Gallinago delicata* (Wilson's Snipe)

Screening, selection and basic temporal measurements of *Gallinago delicata* (Wilson's Snipe) drum recordings were completed in Raven. Sounds were visualized using 4 kHz by 7-second spectrograms (Figure 4).

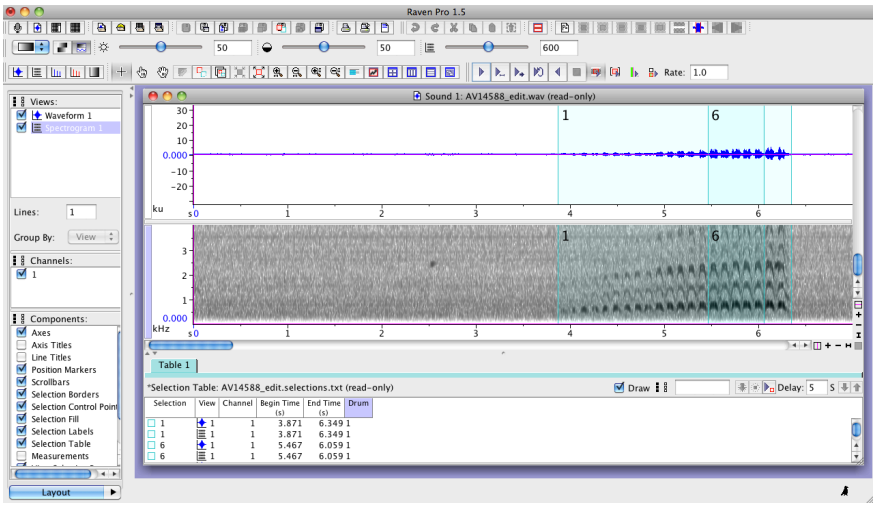

Figure 4. A sound window shown on the Raven desktop, with a waveform view (top) and spectrogram view (bottom). The selections are of a complete drum and of 5 pulses, the 7th to 3rd from the end of the drum.

Spectrograms were of window type Blackman and window size 600, with 90% window overlap. Each recording was reviewed and filtered as needed. The Begin Time and End Time of each drum was recorded. Additionally, the Delta Time for the duration of 5 pulses, the 7th to 3rd from the end of each drum, was recorded. When possible, the Delta Time for inter-drum intervals was also recorded. The measurements for each drum are included in Appendix II. Each drum was saved as a new 16-bit WAV file with 44.1 kHz sample rate.

Pitch measurements of Wilson's Snipe drum recordings were completed in Praat. Sounds were visualized using spectrograms with a view range of 0 to 4000 Hz and a dynamic range of 60 dB (Figure 5).

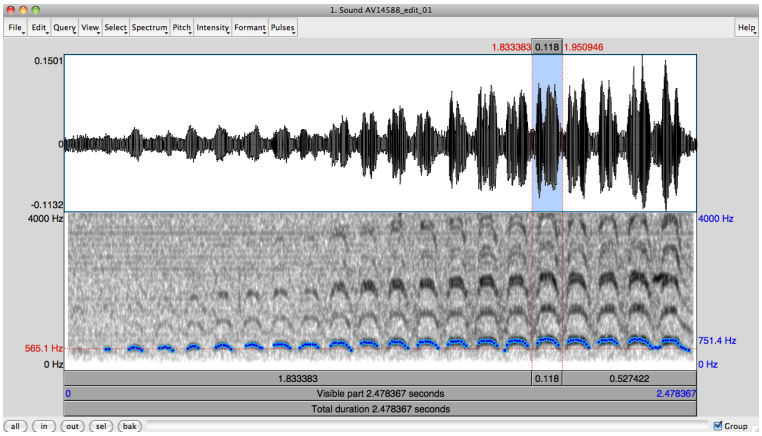

Figure 5. The waveform and spectrogram view for a drum in Praat. The 5th pulse from the end of the drum is selected.

Spectrograms were of window shape Gaussian and window length 0.015 seconds. The time step strategy was fixed with a fixed time step of 0.01 seconds. Pitch analysis used an auto-correlative method on a range of 215 to 4000 Hz. Using the pitch listing tool, the time and frequency values of the 5th pulse from the end of the drum were recorded. At the maximum pitch of this pulse, a spectral slice was generated (Figure 6). The intensity values for the first three harmonics were recorded.

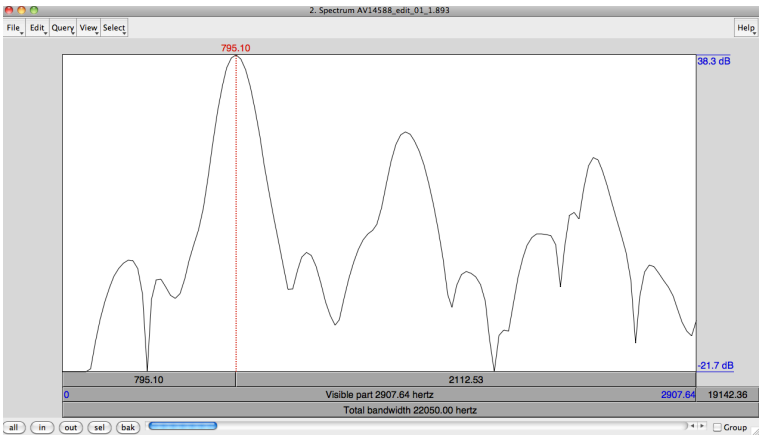

Figure 6. The spectral slice of the 5th pulse from the end of the drum, showing the first three harmonics, in Praat.

The maximum pitch of the 2nd, 4th, 6th, 8th and 10th pulse from the end of the drum was recorded. A sample of these measurements is included in Appendix III.

4.5 Dissection of Various Avian Specimens

To begin, a scalpel was used to make a midline incision through the skin of the breast (Figure 7). Care was taken to not penetrate the body cavity, particularly in the abdominal region. The skin incision was continued to the vent and to the base of the bill.

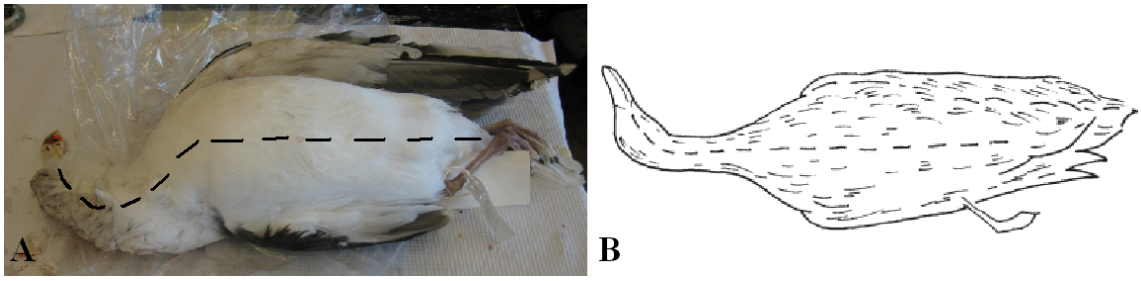

Figure 7. (A) Midline incision on a gull specimen. (B) Diagram of midline incision for dissection.

Next, the skin was reflected away from the neck, breast and abdominal areas (Figure 8).

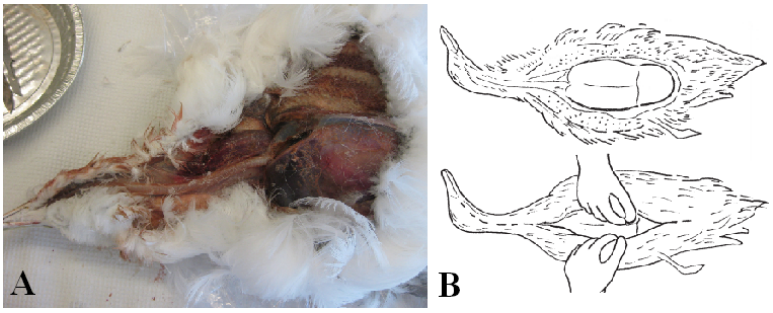

Figure 8. (A) Reflected skin, exposing the underlying anatomy on gull specimen. (B) Diagram of reflected skin for dissection.

With a scalpel, a shallow transverse incision was made just below the breast muscles and sternum. Then, the ribs were carefully cut with scissors (Figure 9). The cut was extended on each side of the breast through the area of the wishbone.

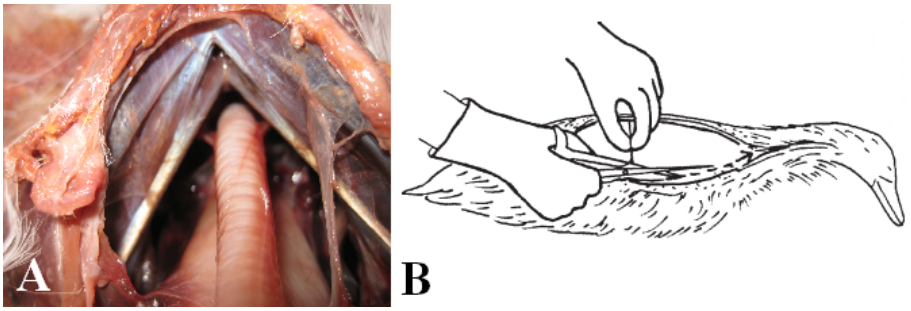

Figure 9. (A) Body cavity of a gull specimen. (B) Diagram of cut through the ribs and wishbone for dissection.

The breastplate was gently separated from the carcass. Scissors were used to server the *M. sternotrachealis* connection and other connections to the breastplate as close to the site of connection on the breastplate as possible (Figure 10).

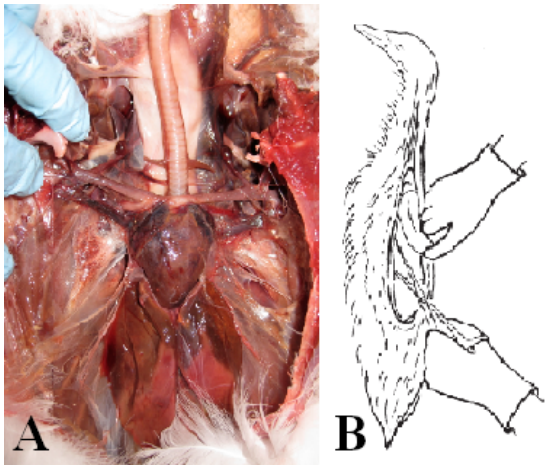

Figure 10. (A) Open body cavity of gull specimen, after breastplate was removed. (B) Diagram of removing breastplate for dissection.

The tongue, trachea and syrinx (vocal apparatus) were removed by cutting one corner of the mouth and pulling the bill away and by cutting through the two bronchi near the lungs (Figure 11).

Figure 11. Vocal apparatus including tongue, trachea and syrinx of gull specimen.

Two *Somateria mollissima* (Common Eider), two *Anas platyrhynchos* (Mallard Duck), one *Aegolius funereus* (Boreal Owl) and five Laridae (gull) species collected in various regions of Newfoundland were dissected to retrieve the vocal apparatus.

Further, the vocal apparatus was rinsed in water to remove feathers, blood and excess tissue. Using a syringe, water was forced through the inside of the trachea, followed by a 10% buffered formalin solution (3.7% formaldehyde) (Figure 12).

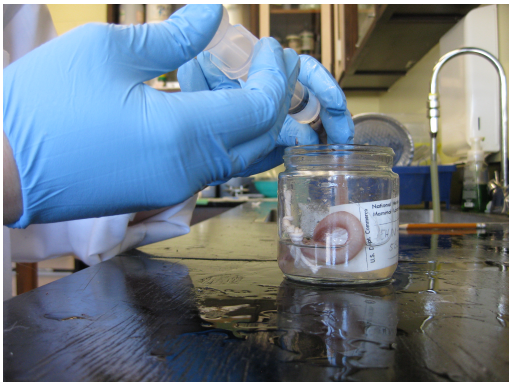

Figure 12. Rising of the vocal apparatus of gull specimen with water using a syringe.

The vocal apparatus was placed in a closed container containing a 10% buffered formalin solution. It was ensured that the vocal apparatus was not floating in the sealed container. After 24hrs, the vocal apparatus was rinsed again in water, followed by a 75% ethanol solution. The 75% ethanol solution was forced through the inside of the trachea using a syringe. Finally, the vocal apparatus was transferred to a closed container containing a 75% ethanol solution for preservation. The container was sealed using Parafilm.

4.6 Measuring Vocal Tracts of Strigiformes

The variables described below were measured for the vocal tracts of *Bubo scandiacus* (Snowy Owl), *Bubo virginianus* (Great Horned Owl) and *Strix varia* (Barred Owl). Appendix IV contains the measured values for each specimen. The variables are partly based on Miller (1934). They were measured using an ocular micrometer in a Wild M3 Stereomicroscope.

1. Breadth at the insertion of the *M. tracheolateralis* on both the left and right bronchial rings.
2. Breadth of the *M. sternotrachealis* on both the left and right sides at the point of apparent maximal breadth.
3. Maximal breadth across the bronchial rings, measured in the dorsal aspect. This measure is on the bronchial rings, just anterior to the large membranous areas.
4. Depth of the largest bronchial ring, just anterior to the large membranous areas, on both the left and right sides.
5. Bronchial diameter on the left side. Measurement is taken at the narrowest part of the left bronchus.
6. Tracheal depth 1.5 inches above (towards tongue) where the *M. sternotrachealis* diverges from the trachea or at the further point (towards tongue) from where the *M. sternotrachealis* diverges when the trachea is cut.
7. Tracheal diameter 1.5 inches above (towards tongue) where the *M. sternotrachealis* diverges from the trachea or at the further point (towards tongue) from where the *M. sternotrachealis* diverges when the trachea is cut.

These variables are illustrated in Figures 13 and 14.

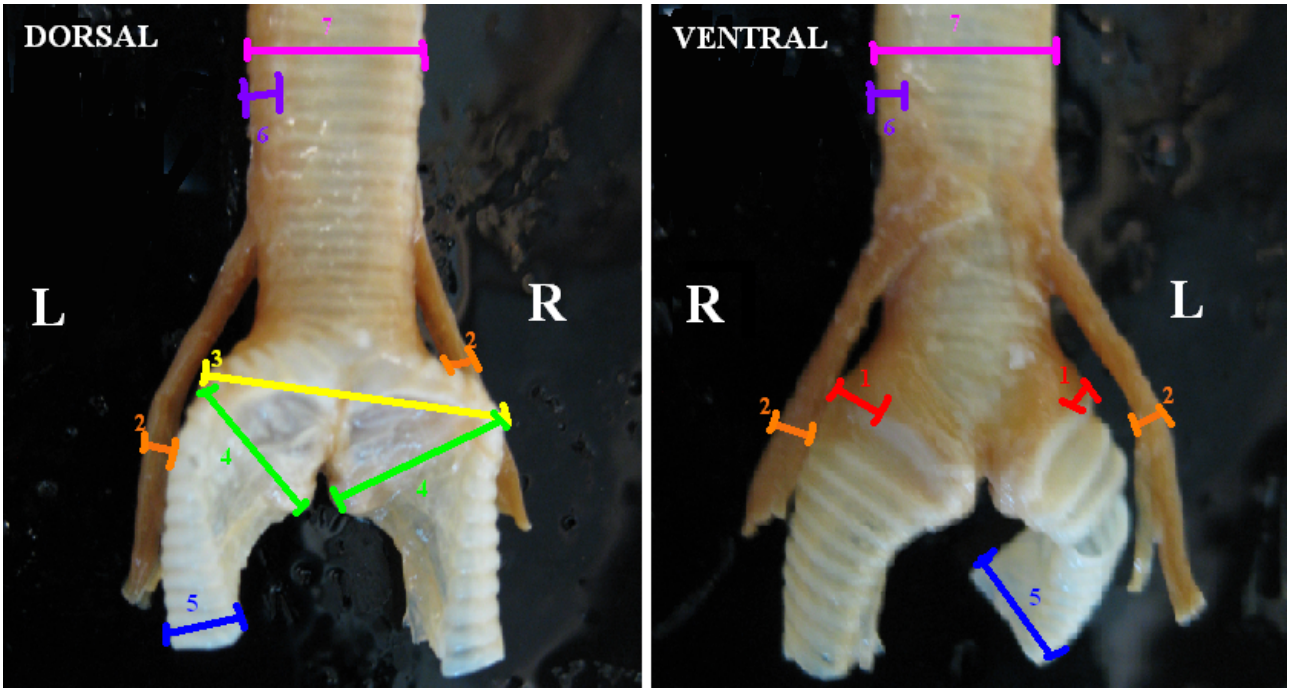

Figure 13. Dorsal and ventral view of the vocal tract of *Bubo virginianus* (EHM 329). The variables labeled are as follows: (1) Breadth at insertion point of *M. tracheolateralis* on bronchial ring, (2) breadth of *M. sternotrachealis*, (3) maximal breadth across bronchial rings, (4) depth of bronchial rings, (5) diameter of left bronchus, (6) tracheal depth and (7) tracheal diameter.

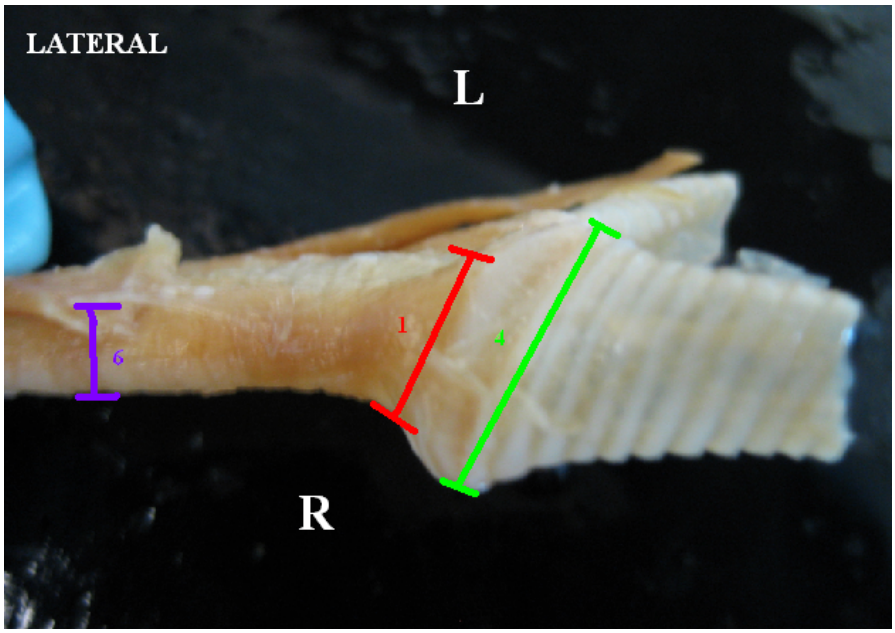

Figure 14. Lateral view of the vocal tract of *Bubo virginianus* (EHM 329). The variables labeled are as follows: (1) Breadth at insertion point of *M. tracheolateralis* on bronchial ring, (4) depth of bronchial rings and (6) tracheal depth.

4.7 Cleaning of *Lynx canadensis subsolanus* Skulls

Several skulls of *Lynx canadensis subsolanus*, the Newfoundland lynx, were cleaned for Bob Rogers's honours thesis research on the sexual-size dimorphism of this subspecies (Figure 15). Skulls were immersed in water overnight to hydrate dried tissue. Hydrated tissue was removed using scoopulas, scissors and scalpels. This enabled more accurate measurements of the skulls.

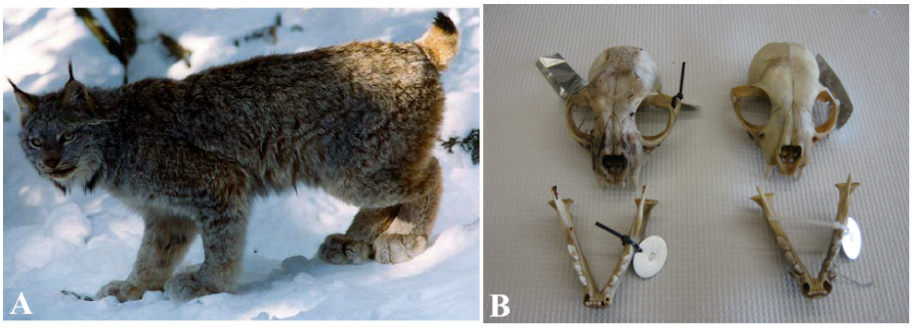

Figure 15. (A) *Lynx canadensis subsolanus*, the Newfoundland Lynx. Photo courtesy of Gerry Yetman. (B) Two skulls of *Lynx canadensis subsolanus*.

4.8 Cleaning of *Canis latrans* Penises

Several penises of *Canis latrans*, coyotes, were cleaned to retrieve the baculum bone (Figure 16). Tissue was removed using scissors, tweezers and scalpels to allow *Dermestidae*, skin beetles, to clean the bone for future research.

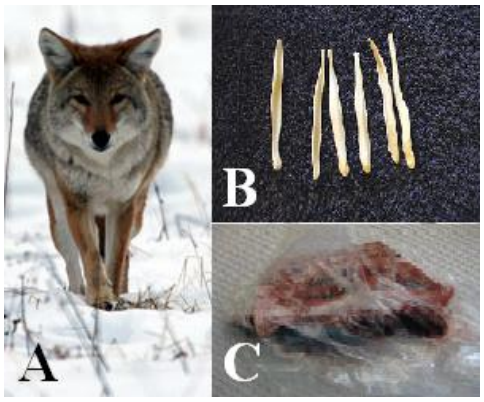

Figure 16. (A) *Canis latrans*, coyote. Photo courtesy of Jim Robertson. (B) Baculum bones of *Canis latrans*. (C) Penis of *Canis latrans*.

5.0 Study Conclusions and Recommendations

5.1 Basic Temporal Measurements of *Gallinago delicata* (Wilson's Snipe) Drum Recordings

5.1.1 Inter-Drum Interval Trends

When possible, inter-drum intervals were measured and recorded. Using JMP (2007) software, the mean of these values (n = 902) was calculated to be 8.31 seconds with a standard deviation of 7.80 seconds. The histogram in Figure 17 shows that the distribution is extremely skewed to the right. There are several details that could explain this observation. First, due to the varying quality of recordings, it is possible that several drums were not detected and therefore, increased the inter-drum interval time. Additionally, it is possible that there were multiple birds in one recording. In this case, the inter-drum interval could have not been measured between drums of the same bird, producing an inaccurate measure. Thus, the inter-drum interval time is not an ideal temporal measurement to characterize the drum of Wilson's Snipe.

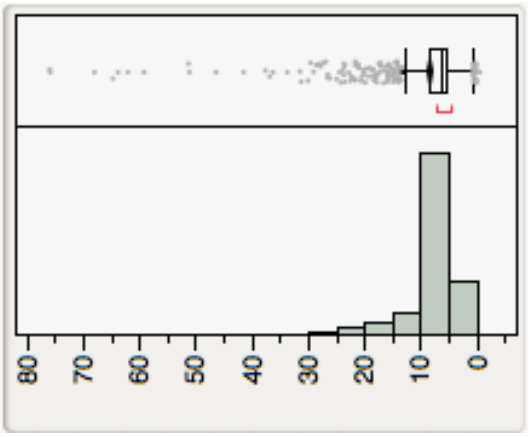

Figure 17. Histogram and box-plot of inter-drum interval values (seconds) for drum recordings of *Gallinago delicata* (Wilson's Snipe).

5.1.2 Drum Duration Trends

Drum duration values follow a near normal distribution (Figure 18). Using JMP software, the mean of these values (n = 1145) was calculated to be 3.01 seconds with a standard deviation of 0.70 seconds. Outliers could possibly result from the identification of multiple drums as one or the early termination of a drum. These trends suggest that there is little variation in the drum duration within the species, regardless of their geographic location.

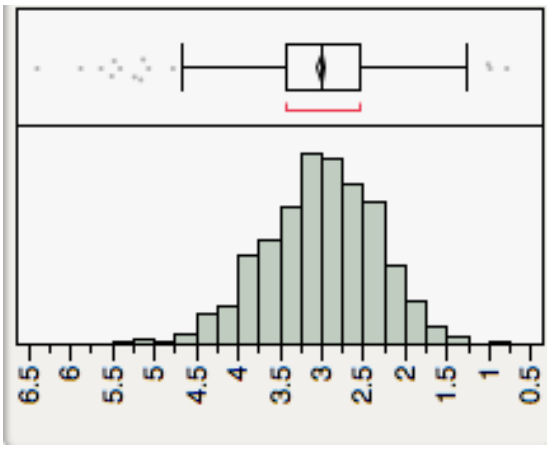

Figure 18. Histogram and box-plot of drum duration values (seconds) for drum recordings of *Gallinago delicata* (Wilson's Snipe).

5.1.3 Duration of Five Pulses Trends

The duration of five pulses, i.e. the 7th to the 3rd pulses from the end of the drum, also follows a near normal distribution (Figure 19). Using JMP software, the mean of these values (n = 1143) was calculated to be 0.57 seconds with a standard deviation of 0.04 seconds. This suggests that male *Gallinago delicata* (Wilson's Snipe) produce a pulse at a frequency of approximately 0.114 ± 0.008 Hz during a drum. The few outliers and small standard deviation show that there is little variation in the duration of five pulses within the species, regardless of their geographic location.

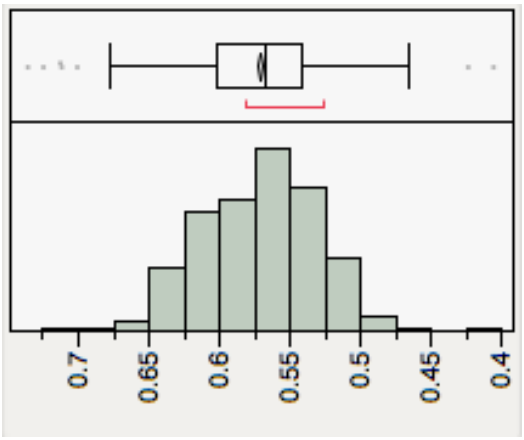

Figure 19. Histogram and box-plot of the values of the duration of five pulses, i.e. the 7th to the 3rd pulse from the end of the drum, (seconds) for drum recordings of *Gallinago delicata* (Wilson's Snipe).

5.2 Vocal Tract Measurements for Three Species of Strigiformes

Not enough specimens of each of the three species were measured to produce visible trends and accurate statistics. The most inaccurate measure is variable 5, the bronchial diameter on the left side. This measure varies greatly due to the fact that where the bronchus was cut from the lung is highly variable in specimens. It is also expected that the tracheal depth will vary significantly depending on whether the *M. tracheolateralis* was removed prior to measurements. Further, error in the variables measured with the ocular micrometer is estimated to be approximately ± 1 mm. Error is contributed by how the specimen was cleaned, i.e. how much excess fat and connective tissue was removed, the orientation of the specimen during measurements and where variables were measured on the specimen. However, it is expected that measures will be reproducible.

5.3 Unmet Workplace Objectives

The following workplace objectives were not met during the work term:

1. Characterizing the "drumming" sound produced by male *Gallinago gallinago* (Common Snipe).
2. Measuring the vocal tracts of all 400 specimens of Strigiformes and Falconiformes.

Measuring and characterizing each drum recording of *Gallinago delicata* (Wilson's Snipe) proved to be a difficult and lengthy process. Thus, due to time constraints, drum recordings of *Gallinago gallinago* (Common Snipe) were not measured and characterized. This data set was to be used to compare time and pitch characters of drums produced by Wilson's Snipe to those produced by the Common Snipe. Further, measurements on the 400 specimens of Strigiformes and Falconiformes vocal tracts were not completed. This was also due to time constraints. More detailed analyses of these data sets will be completed in the future.

5.4 Recommendations of Future Directions for Study and Analysis

5.4.1 Analysis of *Gallinago delicata* (Wilson's Snipe) Drum Recordings

Future directions for study and analysis should focus on a comparison between different species of *Gallinago*. However, unmet objectives outlined in section 5.3 should first be completed. A similar analysis process should also be repeated for other species in order to be able to accurately compare the data. This will enable the researcher to explore geographical variation around the world in the "drumming" sound produced by male *Gallinago*.

5.4.2 Measurement of Vocal Tracts of Strigiformes

Future directions for study and analysis should focus on a comparison between Strigiformes and Falconiformes. However, the same analysis process should first be completed for the remaining Strigiformes and Falconiformes specimens in order to be able to accurately compare the data. This will enable the researcher to explore the sexual dimorphism between males and females within and between species.

5.5 Relevant Academic Courses

The most useful previously taken academic class for the work term was Diversity of Life I (BIOL 2003). This class provided some of the general background information on birds needed to understand scientific articles related to the research. Introduction to Physics (PHYC 1290) was also a useful previously taken academic class. This course explored the simple physics concepts related to sound (i.e. frequency, period, pitch, intensity etc.) that are needed to visualize and understand the analysis process of drum recordings.

Recommended future classes include Vertebrate Design: Evolution and Function (BIOL 3326), Ornithology (BIOL 3622), Design of Biological Experiments (BIOL 4061) and Analysis of Biological Data (BIOL 4062). These classes focus on avian biology or have a heavy emphasis on data analysis methods.

6.0 Personal Objectives

6.1 Review of Personal Objectives

All but one of my personal objectives were fulfilled during the work term. Each was realistic and appropriate. Below is a reflection on each objective.

6.1.1 Explore the St John's, Newfoundland Region

This work term provided a unique opportunity to live and work in a region of Canada that I had never explored. While in St John's, Newfoundland, I had the opportunity to visit the Newfoundland and Labrador House of Assembly, the Rooms Provincial Archives, Art Gallery and Museum, Cape Spear, the easternmost point in North America, George Street, the street with the most bars and pubs per square foot in North America, and Signal Hill, where the first transatlantic wireless transmission was received. However, I did not have the opportunity to explore the region as much as I had envisioned and wanted. Most of the tourist destinations were far away from the university and were only accessible by car. The local transportation system was poor and did not enable travel in the region. I wish I had the opportunity to visit Gros Morne National Park and to see an iceberg.

6.1.2 Acquire Experience in a Different Academic Research Environment

Based on my previous experience in the academic-based research community, I expected the workplace to be a fast-paced, demanding environment. However, the academic research environment at Memorial University of Newfoundland was slow-paced and relaxed. More detailed observations of this academic research environment will be discussed in section 7.0.

6.1.3 Build Relationships with Supervisor, Other Faculty Members, Students and Members of the Community

Networking has become a necessity to ensure future success and development of one's career. Working in harmony with others and contributing to group effectiveness are essential when building relationships with supervisors, other faculty members, students and members of the community. During the work term, I joined the Eastern Edge Robotics Team. Through my participation with the team, which built a Remotely Operated Vehicle (ROV) for the 12th Annual Marine Advanced Technology Education (MATE) Center International ROV Competition, I met numerous students studying at the Fisheries and Marine Institute of Memorial University of Newfoundland. Additionally, I met the Head of the School of Ocean Technology, Mr. Dwight Howse. Further, Dr. Miller has offered me a position in his laboratory as a graduate student.

6.1.4 Explore Graduate Opportunities at Memorial University of Newfoundland

The Biology Department at Memorial University of Newfoundland has one of the largest graduate programs at the university. It offers both M.Sc. and Ph.D. programs in Biology. Additionally, the Department of Ocean Sciences offers both M.Sc. and Ph.D. programs in Marine Biology. However, this department is much smaller. Memorial offers some of the lowest graduate tuition rates in Canada and competitive funding packages.

The Fisheries and Marine Institute offers a Technician Diploma in Remotely Operated Vehicles (ROV), and master's degrees in Marine Studies, and Technology and Maritime Management. Students in each of these programs participate in technical sessions and projects that put the theory learned in class to work. Most of the programs include work terms to provide hands-on experience and offer online courses.

6.1.5 Understand the Purpose of Graduate Studies in Biology at Memorial University of Newfoundland

The main purpose of the Master of Science in Biology at Memorial University of Newfoundland is to provide students with experience in coordinating a time-limited research project including a written document in a thesis format. Students are expected to develop defined hypotheses, explore appropriate methods, and present results and a discussion of results in the context of other work in the field. The conclusions and suggestions for further work demonstrate the progress achieved.

The main purpose of the doctoral program in Biology at Memorial University of Newfoundland is to provide students with the opportunity to gain a high degree of competence in conducting original research at an advanced level. After completing the Ph.D. program, students should not only be competent researchers in their field, but also be able to communicate and evaluate technical information. The original research should result in a significant advance in knowledge in the field of study.

6.1.6 Participate in Faculty Events

During the work term, I had the opportunity to attend R workshops, Biology and Geography Department seminars and the Conservation Biology I: Conservation in Biology and Geography course. The R workshops were held weekly and covered topics such as using LaTex with R to create documents and using packages such as ggplot2 to improve publications. Biology and Geography Department seminars were also held weekly and covered topics ranging from mechanistic biogeography to the ecology and evolution of sociality, and featured speakers from universities across Canada. Conservation Biology I: Conservation in Biology and Geography is a fourth year level course and was held for 1h15 on Tuesdays and Thursdays. Topics covered included

biodiversity threats, conservation tools at the organism, population and community level, protected areas and human impacts. Dr. Luise Hermanutz and Dr. Shawn Leroux from the Biology Department were the instructors for the course.

6.2 Assessment of Personal Development and Performance

Living in a new place during the work term presented many challenges. Finding a place to live was a difficult task in a city with limited housing opportunities. Additionally, learning where services were offered and about the local transportation system was challenging. However, this move provided an opportunity for personal development. I became more patient as I realized that building a life in a new place takes time. I learned the importance of using local resources, as this is how I found housing and services. Further, it is important for me personally to stay in contact with friends and to participate in activities outside the workplace. To overcome the high emotional cost of leaving friends and family behind, I joined the Eastern Edge Robotics Team to meet new people and keep myself occupied. Overall, this was an incredible opportunity for personal growth and learning.

7.0 Observations of the Workplace

7.1 Relationships Within and Outside of the Workplace

I felt as though I "fit in" very well into the place of employment. My supervisor provided a similar amount of feedback, expected the same quality of work and invited me to join the same seminars, symposiums, conferences and thesis defenses as the students in his laboratory. I was always included in discussions and was able to contribute to the conversations.

Dr. Edward (Ted) Miller was extremely helpful and present throughout the work term. He created a great work environment, and was available to answer any questions and to help with any difficulties I encountered. During the work term, Dr. Miller became a great mentor, aiding me choose my next work term at Woods Hole Oceanographic Institute instead of another NSERC USRA at Dalhousie University. Although we do not have a relationship outside of the office, Dr. Miller and I did discuss topics unrelated to the work environment such as his love for eclectic music and my involvement with the Eastern Edge Robotics Team.

An office was shared with M.Sc. candidates Chelsey Lawrence and Stephanie Leger. Both were extremely helpful and incredibly supportive throughout the work term. At various seminars we attended together, Chelsey and Stephanie introduced me to other graduate students in the department. As a result, I was invited to social gatherings on numerous occasions. We also discussed topics ranging from fashion to science in the office. I did not have the opportunity to interact with other members of Dr. Miller's laboratory.

7.2 Comparison of Work Styles Between the Workplace and the Academic Setting

In the workplace, employees are often asked to independently make important decisions. Supervisors may offer direction; however do not make final decisions. The amount of supervision provided varies depending on the needs of individual employees and the stage of the project. Nevertheless, because success is achieved as a team, supervisors are active team members and often aid in the completion of small-scale projects. This increases the probability of success of the encompassing large-scale project and thus, the success of all members of the team. Due to the large number of individuals generally involved in a project, communication between colleagues is key. Reporting and recording work is important in many studies as they are not started and completed by the same individuals. Yet, email is the most important tool as it is often used to set meeting times and share thoughts about various aspects of the project. All employees are given the opportunity to express his or her opinion. However, individuals working on the project are given the responsibility to decide the direction of the work. Taking the initiative to find innovative solutions is greatly encouraged. Problem-solving skills are essential for such solutions and lead projects to new directions.

In the academic environment, students are usually informed about decisions and expected to abide by them. It is also common to select one "correct" opinion to ease grading and to save time. Thus, differences of opinion are not always encouraged. Due to the large number of students in classes, students do not typically experience one-on-one supervision with the professor. It is the responsibility of the student to complete assignments on time and to attend classes. However, most projects are small-scale and the completion of one small-scale project generally does not affect the completion of others.

Students often work as a team to complete projects. They exchange cell phone numbers, and communicate regularly through social media such as Facebook to set up meetings and to stay informed about the progress of projects. Yet, students are achieving more individualistic goals such as marks in the academic setting. Thus, initiative is emphasised as it often leads to greater success. Learning new problem-solving skills is emphasised, as they are needed when applying knowledge such as during laboratories, tests or exams.

7.3 Workplace Politics and Lines of Authority

Office politics mostly surrounded the issue of funding. In the academic-based scientific community, all projects undertaken are dependent on funding. It was often suggested, but never explicitly said, that faculty members try to circumvent stipulations accompanying their grants to maximize the amount of research that is funded. An on-going debate was about if the government was adequately funding scientific exploration. Additionally, Dr. Edward (Ted) Miller is the Graduate Officer for the Biology Department. Other faculty members frequently sought out advise from him regarding the status of their current and potential students.

7.4 Feedback, Criticism, Self-Confidence and Assertiveness

Feedback and criticism are important aspects of the academic-based scientific community. During the work term, constructive and positive feedback was regularly provided to employees by the supervisor. This was meant to encourage individuals to improve existing ideas or develop new ones. Responses to suggestions and criticisms were generally positive. I frequently sought feedback from my supervisor to improve my performance in the workplace. I attempted to always respond promptly and positively.

Self-confidence and assertiveness were not only valued, but encouraged in the workplace. The frequent positive feedback received helped increase the self-confidence of many employees, including myself. In turn, this improved the overall quality of the work produced. In the workplace, assertiveness is required not merely to have a good idea, but to develop it, fight for it, win supporters for it and do everything within one's power to see that it get translated into reality. Assertiveness was often recognised by the supervisor.

7.5 Time and Stress Management

By managing my time more wisely, I was able to minimize stress. Prioritising, organizing and not over-committing helped develop a balanced schedule, which included breaks and social activities. This was done using to-do lists. Additionally, minimizing distractions, avoiding procrastination and resisting perfectionism saved copious amounts of time, and improved the overall quality of my work. These techniques greatly reduced stress, and improved my physical and emotional well-being.

8.0 Work Term Conclusions and Recommendations

8.1 Expectations of the Work Term

The work term far exceeded all of my expectations. I did not expect to participate in nor complete some of the numerous projects that I had the opportunity to work on such as the analysis of *Gallinago delicata* drum recordings. I am currently working on a publication with Dr. Edward (Ted) Miller based on this work. My supervisor was extremely helpful and present through the work term. The amount of support and advice that I received from both him and his students on various topics was overwhelming. I accomplished much more than both Dr. Miller and I expected.

8.2 Difficulty Level of the Work Term

Based on my skills and previous experience, the work term was of an appropriate level. During the work term, I was challenged to use my previous knowledge of concepts related to sound (e.g. frequency, period, pitch, intensity etc.) to develop a protocol to characterize the "drumming" sound produced by male *Gallinago delicata*. However, a previous knowledge of ornithology would have greatly reduced the difficulty of this work term. Many of the objectives built upon a thorough understanding of the anatomy of birds that I did not possess.

8.3 Enjoyment of the Work Term

Although the material was challenging, I did not find it particularly interesting. This made it occasionally difficult to remain engaged throughout the work term. The work term would have been more interesting if the concepts had been applied to study a marine species. Nevertheless, I very much enjoyed this work term. I sincerely hope to

have the opportunity to work with Dr. Edward (Ted) Miller and the members of his laboratory in the future.

8.4 Recommendations for other Co-op Students

Science co-op students interested in a similar work term should have a concrete understanding of simple physics, particularly concepts related to sound. This previous understanding helped accelerate the analysis process, and facilitated the completion of some of the duties outlined and expected during the work term. Additionally, previous knowledge of ornithology would greatly help the student succeed in this position. For students with this previous knowledge, I would absolutely recommend the position. It was an invaluable learning experience. This position would be an appropriate work term at any point during a student's co-op degree.

8.5 Working in a Similar Environment on a Permanent Basis

Working on a permanent basis in this type of academic-based research community would not be desirable. Although the environment values initiative, organization and creativity in individuals, there was no pressure on individuals to complete tasks. This lack of a sense of urgency did not suit my personality. However, I did enjoy the considerable amount of flexibility in terms of when hours were completed. Additionally, ornithology is not an area that I wish to further investigate. Yet, applying the quantitative passive acoustic methods that I have learned in this work term to animals in the marine realm would be a highly desired research area.

8.6 Conclusions on the Academic Aspects of the Work Term

During the work term, I gained additional experience in research, and skills that will greatly help secure future work terms. This research experience may lead to my second publication, which will help increase my ability to successfully enter graduate school. I also had the opportunity to explore a new academic-based research environment. Additionally, I have found an amazing mentor in Dr. Edward (Ted) Miller, an invaluable outcome. The academic aspects of the work term exceeded my expectations.

8.7 Conclusions on the Personal Aspects of the Work Term

Although I did not fulfil all of my personal objectives throughout the work term, I am extremely content with my experience. I discovered that the workplace environment at Memorial University of Newfoundland is not the type of setting that I wish to work in on a permanent basis in the future. In addition, I am now aware of the difficulties associated with living in a new place. I hope to use what I have learned during this work term to ease my transition into my next work term at Woods Hole Oceanographic Institution in Boston, Massachusetts.

Appendix I: *Gallinago gallinago* (Common Snipe) and *Gallinago delicata* (Wilson's Snipe) Recordings

Table A1.1. Information for *Gallinago gallinago* (Common Snipe) and *Gallinago delicata* (Wilson's Snipe) recordings including collection name, tape reference number, genus, species, recordist, date (year, month and day) recorded and location (land mass and country) recorded at.

COLLECTION	TAPE REFERENCE	GENUS	SPECIES	RECORDIST	YEAR	MM-DD-YYYY	LAND MASS	COUNTRY
AVOCET	AV11369	Gallinago	delicata	Rasmussen, Pamela	2013	11-13-2013	NORTH AMERICA	United States
AVOCET	AV14588	Gallinago	delicata	Porter, Cody	2013	5-28-2013	NORTH AMERICA	United States
AVOCET	AV14692	Gallinago	delicata	Rasmussen, Pamela	2013	5-12-2013	NORTH AMERICA	United States
AVOCET	AV14803	Gallinago	delicata	Rasmussen, Pamela	2013	5-14-2013	NORTH AMERICA	Canada
AVOCET	AV16282	Gallinago	gallinago	Rasmussen, Pamela	2013	10-28-2013	EURASIA	United Kingdom
AVOCET	AV3791	Gallinago	gallinago	Rasmussen, Pamela	2013	3-11-2013	EURASIA	Oman
AVOCET	AV3792	Gallinago	gallinago	Rasmussen, Pamela	2013	3-11-2013	EURASIA	Oman
BLOWS	12472	Gallinago	gallinago	Margoschis, Richard	1983	3-21-2013	EURASIA	England
BLOWS	12482	Gallinago	gallinago	Margoschis, Richard	1983	5-8-2013	EURASIA	England
BLOWS	12525	Gallinago	gallinago	Goodwin, Ray	1980	May	EURASIA	Norway
BLOWS	12526	Gallinago	gallinago	Goodwin, Ray	1980	May	EURASIA	Norway
BLOWS	12527	Gallinago	gallinago	Goodwin, Ray	1980	May	EURASIA	Norway
BLOWS	12528	Gallinago	gallinago	Goodwin, Ray	1980	May	EURASIA	Norway
BLOWS	12529	Gallinago	gallinago	Goodwin, Ray	1980	May	EURASIA	Norway
BLOWS	12530	Gallinago	gallinago	Goodwin, Ray	1980	May	EURASIA	Norway
BLOWS	12534	Gallinago	gallinago	Goodwin, Ray	1980	May	EURASIA	Norway
BLOWS	12536	Gallinago	gallinago	Goodwin, Ray	1980	May	EURASIA	Norway
BLOWS	12540	Gallinago	gallinago	Goodwin, Ray	1980	May	EURASIA	Norway
BLOWS	12541	Gallinago	gallinago	Goodwin, Ray	1980	May	EURASIA	Norway
BLOWS	12553	Gallinago	gallinago	Goodwin, Ray	1980	May	EURASIA	Norway
BLOWS	12566	Gallinago	gallinago	Goodwin, Ray	2013	5-14-2013	EURASIA	Norway

BLOWS	14724	Gallinago	gallinago	Margoschis, Richard	1984	4-8-2013	EURASIA	England
BLOWS	14918	Gallinago	gallinago	Margoschis, Richard	1986	4-14-2013	EURASIA	England
BLOWS	15999	Gallinago	gallinago	Goodwin, Ray	1980	5-16-2013		
BLOWS	16002	Gallinago	gallinago	Goodwin, Ray	1980	May		
BLOWS	16030	Gallinago	gallinago	Goodwin, Ray	1980	May	EURASIA	Scandinavia
BLOWS	16045	Gallinago	gallinago	Goodwin, Ray	1980	5-31-2013		
BLOWS	17080	Gallinago	gallinago	Margoschis, Richard	1987	6-30-2013	EURASIA	England
BLOWS	22497	Gallinago	gallinago	Margoschis, Richard	2013	8-17-2013	EURASIA	Scotland
BLOWS	22498	Gallinago	gallinago	Margoschis, Richard	1974	6-15-2013	EURASIA	England
BLOWS	23185	Gallinago	gallinago	Lewis, Victor C.	1974	5-2-2013	EURASIA	England
BLOWS	23704	Gallinago	gallinago	Ashby, A. Rex	1987	5-22-2013	EURASIA	England
BLOWS	23711	Gallinago	gallinago	Ashby, A. Rex	1988	6-2-2013	EURASIA	England
BLOWS	24646	Gallinago	gallinago	Watson, Christopher	2013	5-24-2013	EURASIA	Scotland
BLOWS	24916	Gallinago	gallinago	Watson, Christopher	2013	5-16-2013	EURASIA	Scotland
BLOWS	28238	Gallinago	gallinago	Veprintsev, Boris	1979	May	EURASIA	Russian Federation
BLOWS	28239	Gallinago	gallinago	Veprintsev, Boris	1979	May	EURASIA	Russian Federation
BLOWS	28240	Gallinago	gallinago	Veprintsev, Boris	1979	May	EURASIA	Russian Federation
BLOWS	28241	Gallinago	gallinago	Veprintsev, Boris	1976	June	EURASIA	Russian Federation
BLOWS	28242	Gallinago	gallinago	Veprintsev, Boris	1976	June	EURASIA	Russian Federation
BLOWS	32681	Gallinago	gallinago	Roché, Jean-Claude	1976	May	NORTH AMERICA	Canada
BLOWS	36561	Gallinago	gallinago	Roché, Jean-Claude	2013	6-23-2013	EURASIA	Finland
BLOWS	36562	Gallinago	gallinago	Roché, Jean-Claude	2013	5-6-2013	EURASIA	Finland
BLOWS	36563	Gallinago	gallinago	Roché, Jean-Claude	1963	May	EURASIA	Finland
BLOWS	36564	Gallinago	gallinago	Roché, Jean-Claude			EURASIA	France
BLOWS	36565	Gallinago	gallinago	Roché, Jean-Claude			EURASIA	France
BLOWS	36566	Gallinago	gallinago	Roché, Jean-Claude			EURASIA	France
BLOWS	36567	Gallinago	gallinago	Roché, Jean-Claude	2013	4-22-2013	EURASIA	France
BLOWS	36568	Gallinago	gallinago	Roché, Jean-Claude	2013	4-22-2013	EURASIA	France
BLOWS	38303	Gallinago	gallinago	Roché, Jean-Claude	1973	May	NORTH AMERICA	United States

BLOWS	47590	Gallinago	gallinago	Svensson, Lars	2013	4-8-2013	EURASIA	Sweden
BLOWS	50326	Gallinago	gallinago	Pedley, William	1971	7-18-2013	EURASIA	England
BLOWS	50327	Gallinago	gallinago	Pedley, William	2013	7-18-2013	EURASIA	England
BLOWS	50328	Gallinago	gallinago	Pedley, William	2013	7-18-2013	EURASIA	England
BLOWS	50329	Gallinago	gallinago	Pedley, William	2013	4-16-2013	EURASIA	England
BLOWS	50330	Gallinago	gallinago	Pedley, William	2013	4-16-2013	EURASIA	England
BLOWS	50331	Gallinago	gallinago	Pedley, William	2013	4-28-2013	EURASIA	England
BLOWS	50332	Gallinago	gallinago	Pedley, William	2013	4-26-2013	EURASIA	England
BLOWS	50333	Gallinago	gallinago	Pedley, William	2013	4-26-2013	EURASIA	England
BLOWS	50334	Gallinago	gallinago	Pedley, William	2013	5-7-2013	EURASIA	England
BLOWS	60670	Gallinago	gallinago	Cosburn, Tom	1996	6-14-2013	NORTH AMERICA	Canada
BLOWS	60671	Gallinago	gallinago	Cosburn, Tom	1996	3-30-2013	NORTH AMERICA	Canada
BLOWS	67812	Gallinago	gallinago	Cosburn, Tom	1988	5-26-2013	NORTH AMERICA	Canada
BLOWS	67813	Gallinago	gallinago	Cosburn, Tom	1978	4-9-2013	NORTH AMERICA	Canada
BLOWS	67814	Gallinago	gallinago	Cosburn, Tom	1987	5-30-2013	NORTH AMERICA	Canada
BLOWS	70290	Gallinago	gallinago	Knox, Alan	2013	5-20-2013	EURASIA	Iceland
BLOWS	70291	Gallinago	gallinago	Knox, Alan	2013	5-20-2013	EURASIA	Iceland
BLOWS	70292	Gallinago	gallinago	Knox, Alan	2013	5-20-2013	EURASIA	Iceland
BLOWS	70335	Gallinago	gallinago	Knox, Alan	2013	5-24-2013	EURASIA	Iceland
BLOWS	70351	Gallinago	gallinago	Knox, Alan	2013	5-27-2013	EURASIA	Iceland
BLOWS	70429	Gallinago	gallinago	Knox, Alan	2013	6-3-2013	EURASIA	Iceland
BLOWS	74102	Gallinago	gallinago	Turner, Kyle	2013	4-26-2013	EURASIA	England
BLOWS	74359	Gallinago	gallinago	Turner, Kyle	2013	4-3-2013	EURASIA	England
BLOWS	74517	Gallinago	gallinago	Turner, Kyle	2013	1-9-2013	EURASIA	England
BLOWS	74518	Gallinago	gallinago	Turner, Kyle	2013	1-9-2013	EURASIA	England
BLOWS	79264	Gallinago	gallinago	Turner, Kyle	2013	5-30-2013	EURASIA	England
BLOWS	79449	Gallinago	gallinago	Turner, Kyle	2013	5-13-2013	EURASIA	England
BLOWS	90347	Gallinago	gallinago	Cosburn, Tom	2000	6-6-2013	NORTH AMERICA	Canada
BLOWS	90348	Gallinago	gallinago	Cosburn, Tom	2000	6-8-2013	NORTH AMERICA	Canada

BLOWS	90349	Gallinago	gallinago	Cosburn, Tom	2000	6-6-2013	NORTH AMERICA	Canada
BLOWS	90350	Gallinago	gallinago	Cosburn, Tom	2000	6-8-2013	NORTH AMERICA	Canada
BLOWS	91320	Gallinago	gallinago	Turner, Kyle	2013	5-31-2013	EURASIA	England
BLOWS	91321	Gallinago	gallinago	Turner, Kyle	2013	5-31-2013	EURASIA	England
BLOWS	91322	Gallinago	gallinago	Turner, Kyle	2013	5-31-2013	EURASIA	England
BLOWS	91323	Gallinago	gallinago	Turner, Kyle	2013	5-31-2013	EURASIA	England
BLOWS	92510	Gallinago	gallinago	Turner, Kyle	2013	5-28-2013	EURASIA	England
BLOWS	100239	Gallinago	gallinago	Cosburn, Tom	1998	6-2-2013	NORTH AMERICA	Canada
BLOWS	100240	Gallinago	gallinago	Cosburn, Tom	1999	6-26-2013	NORTH AMERICA	Canada
BLOWS	120833	Gallinago	gallinago	Burbidge, Alan	2013	5-30-2013	EURASIA	Scotland
BLOWS	126983	Gallinago	gallinago	de Wijs, Rombout	2013	4-17-2013	EURASIA	Netherlands
BLOWS	127125	Gallinago	gallinago	Nobles, Eric			EURASIA	United Kingdom
BLOWS	129520	Gallinago	gallinago	McGinn, Derek	2013	5-15-2013	EURASIA	Scotland
BLOWS	129521	Gallinago	gallinago	McGinn, Derek	2013	5-15-2013	EURASIA	Scotland
BLOWS	129522	Gallinago	gallinago	McGinn, Derek	1992	May	EURASIA	Scotland
BLOWS	129523	Gallinago	gallinago	McGinn, Derek			EURASIA	Scotland
BLOWS	130391	Gallinago	gallinago	Cosburn, Tom	2002	6-11-2013	NORTH AMERICA	Canada
BLOWS	130392	Gallinago	gallinago	Cosburn, Tom	2002	6-10-2013	NORTH AMERICA	Canada
BLOWS	131384	Gallinago	gallinago	Cosburn, Tom	2004	5-29-2013	NORTH AMERICA	Canada
BLOWS	131385	Gallinago	gallinago	Cosburn, Tom	2004	6-3-2013	NORTH AMERICA	Canada
BLOWS	132122	Gallinago	gallinago	Harrap, Simon	2001	June	EURASIA	Finland
BLOWS	143643	Gallinago	gallinago	Burbidge, Alan	2013	4-26-2013	EURASIA	England
BLOWS	143649	Gallinago	gallinago	Burbidge, Alan	2013	4-26-2013	EURASIA	England
BLOWS	143788	Gallinago	gallinago	Burbidge, Alan	2013	5-7-2013	EURASIA	England
BLOWS	143789	Gallinago	gallinago	Burbidge, Alan	2013	5-7-2013	EURASIA	England
BLOWS	143790	Gallinago	gallinago	Burbidge, Alan	2013	5-7-2013	EURASIA	England
BLOWS	143808	Gallinago	gallinago	Burbidge, Alan	2013	7-1-2013	EURASIA	England
BLOWS	143812	Gallinago	gallinago	Burbidge, Alan	2013	7-1-2013	EURASIA	England
BLOWS	145144	Gallinago	gallinago	Burbidge, Alan	2013	6-5-2013	EURASIA	Scotland

BLOWS	145145	Gallinago	gallinago	Burbidge, Alan	2013	6-5-2013	EURASIA	Scotland
BLOWS	145146	Gallinago	gallinago	Burbidge, Alan	2013	6-5-2013	EURASIA	Scotland
BLOWS	145147	Gallinago	gallinago	Burbidge, Alan	2013	6-6-2013	EURASIA	Scotland
BLOWS	145893	Gallinago	gallinago	Burbidge, Alan	2013	6-11-2013	EURASIA	Scotland
BLOWS	145949	Gallinago	gallinago	Burbidge, Alan	2013	6-17-2013	EURASIA	Scotland
BLOWS	152126	Gallinago	gallinago	Lumsdaine, David	2013	5-29-2013	EURASIA	England
BLOWS	183285	Gallinago	gallinago	Burbidge, Alan	2013	5-21-2013	EURASIA	Scotland
BLOWS	183324	Gallinago	gallinago	Burbidge, Alan	2013	5-23-2013	EURASIA	Scotland
BLOWS	183325	Gallinago	gallinago	Burbidge, Alan	2013	5-23-2013	EURASIA	Scotland
BLOWS	183326	Gallinago	gallinago	Burbidge, Alan	2013	5-23-2013	EURASIA	Scotland
BLOWS	183327	Gallinago	gallinago	Burbidge, Alan	2013	5-23-2013	EURASIA	Scotland
BLOWS	183328	Gallinago	gallinago	Burbidge, Alan	2013	5-23-2013	EURASIA	Scotland
BLOWS	183329	Gallinago	gallinago	Burbidge, Alan	2013	5-24-2013	EURASIA	Scotland
BLOWS	183333	Gallinago	gallinago	Burbidge, Alan	2013	5-24-2013	EURASIA	Scotland
BLOWS	183335	Gallinago	gallinago	Burbidge, Alan	2013	5-24-2013	EURASIA	Scotland
BLOWS	199325	Gallinago	gallinago	Elliot, Simon T.	2013	5-3-2013	EURASIA	Scotland
BLOWS	O2268	Gallinago	gallinago	Genever, R. W.	1967	May	EURASIA	Scotland
BLOWS	O2269	Gallinago	gallinago	Genever, R. W.	1966	June	EURASIA	England
BLOWS	O2531	Gallinago	gallinago	Bower, Douglas	2013	5-10-2013	EURASIA	Scotland
BLOWS	O5885	Gallinago	gallinago	Baker, Ian D.	2013	6-25-2013	EURASIA	Scotland
BLOWS	O5951	Gallinago	gallinago	Ireland, Doug	1975	4-25-2013	EURASIA	England
BLOWS	O5952	Gallinago	gallinago	Ireland, Doug	1975	4-25-2013	EURASIA	England
BLOWS	OO414	Gallinago	gallinago	Sinclair, Magnus	2013	6-22-2013	EURASIA	Scotland
BLOWS	OO415	Gallinago	gallinago	Sinclair, Magnus	2013	6-22-2013	EURASIA	Scotland
BORROR	7773	Gallinago	delicata		1965	6-29-2013	NORTH AMERICA	United States
BORROR	9077	Gallinago	delicata		1967	6-18-2013	NORTH AMERICA	United States
BORROR	17204	Gallinago	delicata		1989	4-30-2013	NORTH AMERICA	United States
BORROR	17205	Gallinago	delicata		1989	4-16-2013	NORTH AMERICA	United States
BORROR	17535	Gallinago	delicata		1989	6-17-2013	NORTH AMERICA	United States

BORROR	17536	Gallinago	delicata		1989	5-25-2013	NORTH AMERICA	United States
BORROR	23962	Gallinago	delicata		1997	6-11-2013	NORTH AMERICA	United States
BORROR	23973	Gallinago	delicata		1997	6-12-2013	NORTH AMERICA	United States
BORROR	23979	Gallinago	delicata		1997	6-12-2013	NORTH AMERICA	United States
BORROR	24021	Gallinago	delicata		1997	6-10-2013	NORTH AMERICA	United States
BORROR	29783	Gallinago	delicata		1998	6-3-2013	NORTH AMERICA	United States
BORROR	34117	Gallinago	delicata		1991	6-6-2013	NORTH AMERICA	United States
BORROR	32299	Gallinago	gallinago		1966	5-20-2013	EURASIA	Sweden
BORROR	32300	Gallinago	gallinago		1966	5-20-2013	EURASIA	Sweden
BORROR	32301	Gallinago	gallinago		1966	5-20-2013	EURASIA	Sweden
EHM	Flicek_1978_07	Gallinago	delicata	Miller, E.H.	1978	6-10-2013	NORTH AMERICA	Canada
EHM	Flicek_1978_07	Gallinago	delicata	Miller, E.H.	1978	6-10-2013	NORTH AMERICA	Canada
EHM	Flicek_1978_08	Gallinago	delicata	Miller, E.H.	1978	6-10-2013	NORTH AMERICA	Canada
EHM	Flicek_1978_08	Gallinago	delicata	Miller, E.H.	1978	6-10-2013	NORTH AMERICA	Canada
EHM	Flicek_1978_12	Gallinago	delicata	Miller, E.H.	1978	6-14-2013	NORTH AMERICA	Canada
EHM	Flicek_1978_12	Gallinago	delicata	Miller, E.H.	1978	6-14-2013	NORTH AMERICA	Canada
EHM	Flicek_1978_12	Gallinago	delicata	Miller, E.H.	1978	6-14-2013	NORTH AMERICA	Canada
EHM	FTN_82_1	Gallinago	delicata	Miller, E.H.	1982	5-21-2013	NORTH AMERICA	Canada
EHM	FTN_82_1	Gallinago	delicata	Miller, E.H.	1982	5-21-2013	NORTH AMERICA	Canada
EHM	FTN_82_1	Gallinago	delicata	Miller, E.H.	1982	5-21-2013	NORTH AMERICA	Canada
EHM	FTN_82_1	Gallinago	delicata	Miller, E.H.	1982	5-21-2013	NORTH AMERICA	Canada
EHM	Haines_1983_02	Gallinago	delicata	Miller, E.H.	1983	5-21-2013	NORTH AMERICA	Canada
EHM	Haines_1983_06	Gallinago	delicata	Miller, E.H.	1983	5-28-2013	NORTH AMERICA	Canada
EHM	MIDDLETON_03_01	Gallinago	delicata	Miller, E.H.	2003	5-6-2013	NORTH AMERICA	USA
EHM	MIDDLETON_03_02	Gallinago	delicata	Miller, E.H.	2003		NORTH AMERICA	USA
EHM	MIDDLETON_03_03	Gallinago	delicata	Miller, E.H.	2003		NORTH AMERICA	USA
EHM	MIDDLETON_03_04	Gallinago	delicata	Miller, E.H.	2003		NORTH AMERICA	USA
EHM	MIDDLETON_03_05	Gallinago	delicata	Miller, E.H.	2003		NORTH AMERICA	USA
EHM	MIDDLETON_03_06	Gallinago	delicata	Miller, E.H.	2003		NORTH AMERICA	USA

EHM	Nunivak_1988_08	Gallinago	delicata	Miller, E.H.	1988	5-19-2013	NORTH AMERICA	USA
EHM	Nunivak_1988_09	Gallinago	delicata	Miller, E.H.	1988	5-19-2013	NORTH AMERICA	USA
EHM	SEBC_1991_01	Gallinago	delicata	Miller, E.H.	1991	5-18-2013	NORTH AMERICA	Canada
EHM	SEBC_1991_02	Gallinago	delicata	Miller, E.H.	1991	5-19-2013	NORTH AMERICA	Canada
EHM	SEBC_1991_03	Gallinago	delicata	Miller, E.H.	1991	5-20-2013	NORTH AMERICA	Canada
EHM	SEBC_1991_04	Gallinago	delicata	Miller, E.H.	1991	5-21-2013	NORTH AMERICA	Canada
EHM	SEBC_1991_05	Gallinago	delicata	Miller, E.H.	1991	5-21-2013	NORTH AMERICA	Canada
EHM	SEBC_1991_06	Gallinago	delicata	Miller, E.H.	1991	5-22-2013	NORTH AMERICA	Canada
EHM	SEBC_1991_07	Gallinago	delicata	Miller, E.H.	1991	5-22-2013	NORTH AMERICA	Canada
EHM	SEBC_1991_08	Gallinago	delicata	Miller, E.H.	1991	5-23-2013	NORTH AMERICA	Canada
EHM	SEBC_1991_09	Gallinago	delicata	Miller, E.H.	1991	5-23-2013	NORTH AMERICA	Canada
EHM	SEBC_1991_10	Gallinago	delicata	Miller, E.H.	1991	5-23-2013	NORTH AMERICA	Canada
EHM	SEBC_1991_11	Gallinago	delicata	Miller, E.H.	1991	5-24-2013	NORTH AMERICA	Canada
EHM	Yukon_1979_01	Gallinago	delicata	Miller, E.H.	1979	5-29-2013	NORTH AMERICA	Canada
MLNS	19	Gallinago	delicata	Ward, William V.	1977	6-29-2013	NORTH AMERICA	United States
MLNS	3132	Gallinago	delicata	Allen, Arthur A.	1954	6-13-2013	NORTH AMERICA	Canada
MLNS	3133	Gallinago	delicata	Allen, Arthur A.	1954	6-15-2013	NORTH AMERICA	Canada
MLNS	3134	Gallinago	delicata	Allen, Arthur A.	1954	6-28-2013	NORTH AMERICA	Canada
MLNS	3135	Gallinago	delicata	Allen, Arthur A.	1954	6-29-2013	NORTH AMERICA	Canada
MLNS	3136	Gallinago	delicata	Allen, Arthur A.	1954	6-30-2013	NORTH AMERICA	Canada
MLNS	3137	Gallinago	delicata	Allen, Arthur A.	1954	7-2-2013	NORTH AMERICA	Canada
MLNS	3138	Gallinago	delicata	Allen, Arthur A.	1954	6-29-2013	NORTH AMERICA	Canada
MLNS	3139	Gallinago	delicata	Allen, Arthur A.	1954	6-30-2013	NORTH AMERICA	Canada
MLNS	3140	Gallinago	delicata	Stein, R.C.	1958	7-4-2013	NORTH AMERICA	Canada
MLNS	3141	Gallinago	delicata	Stein, R.C.	1958	7-4-2013	NORTH AMERICA	Canada
MLNS	3142	Gallinago	delicata	Stein, R.C.	1959	6-14-2013	NORTH AMERICA	Canada
MLNS	3143	Gallinago	delicata	Stein, R.C.	1959	6-27-2013	NORTH AMERICA	Canada
MLNS	3144	Gallinago	delicata	Stein, R.C.	1959	6-27-2013	NORTH AMERICA	Canada
MLNS	3145	Gallinago	delicata	Stein, R.C.	1961	6-11-2013	NORTH AMERICA	United States

MLNS	3146	Gallinago	delicata	Little, Randolph S.	1962	3-27-2013	NORTH AMERICA	United States
MLNS	3147	Gallinago	delicata	Howell, K.M.	1966	4-19-2013	NORTH AMERICA	United States
MLNS	3148	Gallinago	delicata	North, M.E.W.	1964	12-14-2013	AFRICA	Kenya
MLNS	13231	Gallinago	delicata	Parker, Theodore A.,	1977	9-16-2013	SOUTH AMERICA	Peru
MLNS	18872	Gallinago	delicata	Belton, W.	1972	9-25-2013	SOUTH AMERICA	Brazil
MLNS	24968	Gallinago	delicata	King, B.	1981	3-17-2013	EURASIA	Pakistan
MLNS	42573	Gallinago	delicata	Budney, Gregory F.	1988	6-21-2013	NORTH AMERICA	United States
MLNS	42574	Gallinago	delicata	Budney, Gregory F.	1988	6-21-2013	NORTH AMERICA	United States
MLNS	44388	Gallinago	delicata	Budney, Gregory F.	1989	6-5-2013	NORTH AMERICA	United States
MLNS	44512	Gallinago	delicata	Budney, Gregory F.	1989	6-6-2013	NORTH AMERICA	United States
MLNS	45343	Gallinago	delicata	Little, Randolph S.	1989	6-6-2013	NORTH AMERICA	United States
MLNS	45344	Gallinago	delicata	Little, Randolph S.	1989	6-6-2013	NORTH AMERICA	United States
MLNS	45381	Gallinago	delicata	Little, Randolph S.	1989	6-8-2013	NORTH AMERICA	United States
MLNS	45389	Gallinago	delicata	Little, Randolph S.	1989	6-8-2013	NORTH AMERICA	United States
MLNS	48801	Gallinago	delicata	Colver, Kevin J.	1990	6-10-2013	NORTH AMERICA	United States
MLNS	49466	Gallinago	delicata	Marantz, Curtis A.	1990	6-11-2013	NORTH AMERICA	United States
MLNS	50322	Gallinago	delicata	Keller, Geoffrey A.	1990	6-21-2013	NORTH AMERICA	United States
MLNS	50323	Gallinago	delicata	Keller, Geoffrey A.	1990	6-21-2013	NORTH AMERICA	United States
MLNS	51250	Gallinago	delicata	Peyton, L.J.	1982	6-19-2013	NORTH AMERICA	United States
MLNS	53197	Gallinago	delicata	Hershberger, Wilbur	1995	6-7-2013	NORTH AMERICA	United States
MLNS	53219	Gallinago	delicata	Lang, A.	1990	6-16-2013	NORTH AMERICA	Canada
MLNS	53220	Gallinago	delicata	Lang, A.	1990	6-16-2013	NORTH AMERICA	Canada
MLNS	53244	Gallinago	delicata	Lang, A.	1990	6-18-2013	NORTH AMERICA	Canada
MLNS	53265	Gallinago	delicata	Trumbull, F. & G.	1989	6-12-2013	NORTH AMERICA	USA
MLNS	55522	Gallinago	delicata	Kerr, Donald J.	1993	6-17-2013	NORTH AMERICA	Canada
MLNS	55579	Gallinago	delicata	Gunn, William W. H.	1953	5-19-2013	NORTH AMERICA	Canada
MLNS	55580	Gallinago	delicata	Gunn, William W. H.	1958	5-24-2013	NORTH AMERICA	Canada
MLNS	55581	Gallinago	delicata	Gunn, William W. H.	1958	5-28-2013	NORTH AMERICA	Canada
MLNS	55582	Gallinago	delicata	Gunn, William W. H.	1958	5-29-2013	NORTH AMERICA	Canada

MLNS	55583	Gallinago	delicata	Gunn, William W. H.	1958	5-30-2013	NORTH AMERICA	Canada
MLNS	55584	Gallinago	delicata	Gunn, William W. H.	1958	5-31-2013	NORTH AMERICA	Canada
MLNS	55585	Gallinago	delicata	Gunn, William W. H.	1958	5-31-2013	NORTH AMERICA	Canada
MLNS	55586	Gallinago	delicata	Gunn, William W. H.	1968	6-22-2013	NORTH AMERICA	United States
MLNS	55587	Gallinago	delicata	Gunn, William W. H.	1974	June	NORTH AMERICA	Canada
MLNS	55588	Gallinago	delicata	Gunn, William W. H.	1974	4-20-2013	NORTH AMERICA	Canada
MLNS	55589	Gallinago	delicata	Gunn, William W. H.	1979	5-24-2013	NORTH AMERICA	Canada
MLNS	55590	Gallinago	delicata	Gunn, William W. H.	1977	5-1-2013	NORTH AMERICA	Canada
MLNS	55591	Gallinago	delicata	Gunn, William W. H.	1979	5-27-2013	NORTH AMERICA	Canada
MLNS	56941	Gallinago	delicata	Keller, Geoffrey A.	1991	6-14-2013	NORTH AMERICA	United States
MLNS	56945	Gallinago	delicata	Keller, Geoffrey A.	1991	6-15-2013	NORTH AMERICA	United States
MLNS	63015	Gallinago	delicata	Herr, David S.	1991	6-9-2013	NORTH AMERICA	United States
MLNS	63982	Gallinago	delicata	Kerr, Donald J.	1993	5-23-2013	NORTH AMERICA	Canada
MLNS	64217	Gallinago	delicata	Gunn, William W. H.	1979	5-27-2013	NORTH AMERICA	Canada
MLNS	64218	Gallinago	delicata	Gunn, William W. H.	1980	5-28-2013	NORTH AMERICA	Canada
MLNS	64219	Gallinago	delicata	Gunn, William W. H.	1980	5-28-2013	NORTH AMERICA	Canada
MLNS	73871	Gallinago	delicata	Hershberger, Wilbur	1995	6-8-2013	NORTH AMERICA	United States
MLNS	78506	Gallinago	delicata	Robbins, Mark	1991	5-21-2013	NORTH AMERICA	United States
MLNS	94348	Gallinago	delicata	Hershberger, Wilbur	1998	5-23-2013	NORTH AMERICA	United States
MLNS	94349	Gallinago	delicata	Hershberger, Wilbur	1998	5-23-2013	NORTH AMERICA	United States
MLNS	94350	Gallinago	delicata	Hershberger, Wilbur	1998	5-23-2013	NORTH AMERICA	United States
MLNS	96084	Gallinago	delicata	Budney, Gregory F.	1991	5-23-2013	NORTH AMERICA	United States
MLNS	105806	Gallinago	delicata	Keller, Geoffrey A.	1996	6-15-2013	NORTH AMERICA	Canada
MLNS	106604	Gallinago	delicata	Little, Randolph S.	1994	5-31-2013	NORTH AMERICA	United States
MLNS	106801	Gallinago	delicata	Little, Randolph S.	1997	6-2-2013	NORTH AMERICA	United States
MLNS	106803	Gallinago	delicata	Little, Randolph S.	1997	6-2-2013	NORTH AMERICA	United States
MLNS	106804	Gallinago	delicata	Little, Randolph S.	1997	6-2-2013	NORTH AMERICA	United States
MLNS	111120	Gallinago	delicata	Sander, Thomas G.	1990	5-15-2013	NORTH AMERICA	United States
MLNS	111121	Gallinago	delicata	Sander, Thomas G.	1990	5-15-2013	NORTH AMERICA	United States

MLNS	111124	Gallinago	delicata	Sander, Thomas G.	1990	5-16-2013	NORTH AMERICA	United States
MLNS	111125	Gallinago	delicata	Sander, Thomas G.	1990	5-16-2013	NORTH AMERICA	United States
MLNS	111126	Gallinago	delicata	Sander, Thomas G.	1990	5-16-2013	NORTH AMERICA	United States
MLNS	125349	Gallinago	delicata	Sander, Thomas G.	1990	5-15-2013	NORTH AMERICA	United States
MLNS	128920	Gallinago	delicata	Vyn, Gerrit	2005	3-17-2013	NORTH AMERICA	United States
MLNS	129056	Gallinago	delicata	Andersen, Michael J.	2005	6-16-2013	NORTH AMERICA	United States
MLNS	130921	Gallinago	delicata	Vyn, Gerrit	2006	5-30-2013	NORTH AMERICA	United States
MLNS	135384	Gallinago	delicata	Andersen, Michael J.	2007	3-3-2013	NORTH AMERICA	United States
MLNS	136363	Gallinago	delicata	Andersen, Michael J.	2007	5-31-2013	NORTH AMERICA	United States
MLNS	136370	Gallinago	delicata	Andersen, Michael J.	2007	6-1-2013	NORTH AMERICA	United States
MLNS	136393	Gallinago	delicata	Andersen, Michael J.	2007	6-3-2013	NORTH AMERICA	United States
MLNS	136406	Gallinago	delicata	Andersen, Michael J.	2007	6-4-2013	NORTH AMERICA	United States
MLNS	136413	Gallinago	delicata	Andersen, Michael J.	2007	6-5-2013	NORTH AMERICA	United States
MLNS	137550	Gallinago	delicata	Vyn, Gerrit	2007	5-31-2013	NORTH AMERICA	United States
MLNS	137551	Gallinago	delicata	Vyn, Gerrit	2007	6-1-2013	NORTH AMERICA	United States
MLNS	137554	Gallinago	delicata	Vyn, Gerrit	2007	6-1-2013	NORTH AMERICA	United States
MLNS	172279	Gallinago	delicata	Robbins, Mark	2010	6-23-2013	NORTH AMERICA	United States
MLNS	45991	Gallinago	gallinago	Whitney, Bret M.	1986		NORTH AMERICA	United States
MLNS	49551	Gallinago	gallinago	Peyton, L.J.				
MLNS	74836	Gallinago	gallinago	Veprintsev, Boris N.	1961		EURASIA	Russia
MLNS	74859	Gallinago	gallinago	Kirby, John	1961		EURASIA	United Kingdom
MLNS	75611	Gallinago	gallinago	Veprintsev, Boris N.	1967		EURASIA	Russia
MLNS	75613	Gallinago	gallinago	Veprintsev, Boris N.	1967		EURASIA	Russia
MLNS	77481	Gallinago	gallinago	Verschinen, Vasily	1975		EURASIA	Russia
MLNS	77483	Gallinago	gallinago	Verschinen, Vasily	1975		EURASIA	Russia
MLNS	77484	Gallinago	gallinago	Verschinen, Vasily	1975		EURASIA	Russia
MLNS	86565	Gallinago	gallinago	Finch, Davis W.	1991	11-26-2013	SOUTH AMERICA	Argentina
MLNS	90348	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	90546	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia

MLNS	90553	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	90735	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	90737	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	90740	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	90752	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	90758	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	90927	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	90929	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	90945	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	90951	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	90953	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	90981	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	91102	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	91124	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	91125	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	91189	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	91197	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	91210	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	91220	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	91222	Gallinago	gallinago	Veprintsev, Boris N.	1976		EURASIA	Russia
MLNS	91587	Gallinago	gallinago	Veprintsev, Boris N.	1977		EURASIA	Russia
MLNS	97326	Gallinago	gallinago	Veprintsev, Boris N.				
MLNS	97815	Gallinago	gallinago	Veprintsev, Boris N.	1979		EURASIA	Russia
MLNS	97821	Gallinago	gallinago	Veprintsev, Boris N.	1979		EURASIA	Russia
MLNS	97822	Gallinago	gallinago	Veprintsev, Boris N.	1979		EURASIA	Russia
MLNS	99428	Gallinago	gallinago	Veprintsev, Boris N.	1979		EURASIA	Russia
MLNS	99429	Gallinago	gallinago	Veprintsev, Boris N.	1979		EURASIA	Russia
MLNS	99432	Gallinago	gallinago	Veprintsev, Boris N.	1979		EURASIA	Russia
MLNS	99433	Gallinago	gallinago	Veprintsev, Boris N.	1979		EURASIA	Russia

MLNS	99434	Gallinago	gallinago	Veprintsev, Boris N.	1979		EURASIA	Russia
MLNS	140024	Gallinago	gallinago	Medler, Matthew D.	2009	5-25-2013	EURASIA	Poland
MLNS	140025	Gallinago	gallinago	Medler, Matthew D.	2009	5-25-2013	EURASIA	Poland
XENO	XC103453	Gallinago	delicata	DeFonso, Eric	2012	5-6-2013	NORTH AMERICA	United States
XENO	XC103454	Gallinago	delicata	DeFonso, Eric	2012	5-6-2013	NORTH AMERICA	United States
XENO	XC11712	Gallinago	delicata	Carter, Robin	2007	3-27-2013	NORTH AMERICA	United States
XENO	XC13808	Gallinago	delicata	Spencer, Andrew	2007	6-11-2013	NORTH AMERICA	United States
XENO	XC14873	Gallinago	delicata	Spencer, Andrew	2007	6-14-2013	NORTH AMERICA	United States
XENO	XC21809	Gallinago	delicata	Parrish, Chris	2008	6-8-2013	NORTH AMERICA	United States
XENO	XC21810	Gallinago	delicata	Parrish, Chris	2008	6-8-2013	NORTH AMERICA	United States
XENO	XC21811	Gallinago	delicata	Parrish, Chris	2008	6-8-2013	NORTH AMERICA	United States
XENO	XC31004	Gallinago	delicata	Chartier, Allen T.	2008	4-10-2013	NORTH AMERICA	United States
XENO	XC52504	Gallinago	delicata	Hoyer, Richard C.	2010	5-25-2013	NORTH AMERICA	United States
XENO	XC66182	Gallinago	delicata	Cruickshank, Ian	2012	6-19-2013	NORTH AMERICA	Canada
XENO	XC66908	Gallinago	delicata	Wilson, Todd	2010	4-18-2013	NORTH AMERICA	United States
XENO	XC72970	Gallinago	delicata	O'Donnell, Ryan P.	2010	5-24-2013	NORTH AMERICA	United States
XENO	XC83435	Gallinago	delicata	Geale, David	2011	7-13-2013	NORTH AMERICA	Canada
XENO	XC87162	Gallinago	delicata	Driver, Paul	2008	6-16-2013	NORTH AMERICA	United States
XENO	XC87163	Gallinago	delicata	Driver, Paul	2008	6-16-2013	NORTH AMERICA	United States
XENO	XC89714	Gallinago	delicata	Nelson, Mike	2011	11-2-2013	NORTH AMERICA	United States
XENO	XC100297	Gallinago	gallinago	Niels Krabbe	2013	5-2-2013	EURASIA	Germany
XENO	XC100637	Gallinago	gallinago	Stein Ø. Nilsen	2013	5-9-2013	EURASIA	Norway
XENO	XC100638	Gallinago	gallinago	Stein Ø. Nilsen	2013	5-9-2013	EURASIA	Norway
XENO	XC101766	Gallinago	gallinago	Alan Dalton	2013	5-22-2013	EURASIA	Sweden
XENO	XC101767	Gallinago	gallinago	Alan Dalton	2013	5-22-2013	EURASIA	Sweden
XENO	XC101768	Gallinago	gallinago	Alan Dalton	2013	5-22-2013	EURASIA	Sweden
XENO	XC105894	Gallinago	gallinago	Albert Lastukhin	2013	4-18-2013	EURASIA	Russian Federation
XENO	XC106938	Gallinago	gallinago	Albert Lastukhin	2013	8-5-2013	EURASIA	Russian Federation
XENO	XC107480	Gallinago	gallinago	Volker Arnold	2013	8-12-2013	EURASIA	Germany

XENO	XC107481	Gallinago	gallinago	Volker Arnold	2013	8-12-2013	EURASIA	Germany
XENO	XC108256	Gallinago	gallinago	Jelmer Poelstra	2013	5-6-2013	EURASIA	Sweden
XENO	XC109756	Gallinago	gallinago	Albert Lastukhin	2013	9-14-2013	EURASIA	Russian Federation
XENO	XC112484	Gallinago	gallinago	Sander Bot	2013	6-7-2013	EURASIA	Netherlands
XENO	XC112485	Gallinago	gallinago	Sander Bot	2013	6-7-2013	EURASIA	Netherlands
XENO	XC112675	Gallinago	gallinago	Patrik Åberg	2013	4-24-2013	EURASIA	Sweden
XENO	XC25522	Gallinago	gallinago	Stuart Fisher	2006	January	EURASIA	United Kingdom
XENO	XC25524	Gallinago	gallinago	Stuart Fisher	2006	January	EURASIA	United Kingdom
XENO	XC25844	Gallinago	gallinago	Niels Krabbe	2013	8-9-2013	EURASIA	Denmark
XENO	XC25877	Gallinago	gallinago	Niels Krabbe	2013	8-16-2013	EURASIA	Denmark
XENO	XC27080	Gallinago	gallinago	Patrik Åberg	2013	4-21-2013	EURASIA	Sweden
XENO	XC27081	Gallinago	gallinago	Patrik Åberg	2013	4-29-2013	EURASIA	Sweden
XENO	XC30993	Gallinago	gallinago	Stuart Fisher			EURASIA	United Kingdom
XENO	XC30994	Gallinago	gallinago	Stuart Fisher			EURASIA	United Kingdom
XENO	XC36486	Gallinago	gallinago	Niels Krabbe	2013	7-3-2013	EURASIA	Sweden
XENO	XC36487	Gallinago	gallinago	Niels Krabbe	2013	7-3-2013	EURASIA	Sweden
XENO	XC37489	Gallinago	gallinago	David Farrow	2013	6-7-2013	EURASIA	United Kingdom
XENO	XC40383	Gallinago	gallinago	Jordi Calvet	2013	10-25-2013	EURASIA	Spain
XENO	XC41286	Gallinago	gallinago	Matthias Feuersenger	2013	10-12-2013	EURASIA	Germany
XENO	XC42191	Gallinago	gallinago	Patrik Åberg	2013	6-13-2013	EURASIA	Sweden
XENO	XC42798	Gallinago	gallinago	Stuart Fisher	2013	6-14-2013	EURASIA	United Kingdom
XENO	XC43590	Gallinago	gallinago	Stuart Fisher	2013	3-4-2013	EURASIA	Spain
XENO	XC44818	Gallinago	gallinago	Sander Bot	2013	1-8-2013	EURASIA	India
XENO	XC48182	Gallinago	gallinago	Dougie Preston	2013	4-28-2013	EURASIA	United Kingdom
XENO	XC57906	Gallinago	gallinago	Ruud van Beusekom	2013	5-30-2013	EURASIA	Iceland
XENO	XC57907	Gallinago	gallinago	Ruud van Beusekom	2013	5-30-2013	EURASIA	Iceland
XENO	XC57908	Gallinago	gallinago	Ruud van Beusekom	2013	6-8-2013	EURASIA	Iceland
XENO	XC64623	Gallinago	gallinago	Patrik Åberg	2013	4-16-2013	EURASIA	Sweden
XENO	XC64624	Gallinago	gallinago	Patrik Åberg	2013	4-24-2013	EURASIA	Sweden

XENO	XC64625	Gallinago	gallinago	Patrik Åberg	2013	4-20-2013	EURASIA	Sweden
XENO	XC69856	Gallinago	gallinago	Ruud van Beusekom	2013	4-17-2013	EURASIA	Netherlands
XENO	XC76831	Gallinago	gallinago	Marco Dragonetti	2013	2-14-2013	EURASIA	Italy
XENO	XC76912	Gallinago	gallinago	Jelmer Poelstra	2013	4-21-2013	EURASIA	Sweden
XENO	XC83248	Gallinago	gallinago	Jelmer Poelstra	2013	5-9-2013	EURASIA	Sweden
XENO	XC83879	Gallinago	gallinago	Patrik Åberg	2013	5-30-2013	EURASIA	Iceland
XENO	XC83880	Gallinago	gallinago	Patrik Åberg	2013	5-30-2013	EURASIA	Iceland
XENO	XC83881	Gallinago	gallinago	Patrik Åberg	2013	5-31-2013	EURASIA	Iceland
XENO	XC85096	Gallinago	gallinago	Nils Agster	2013	7-30-2013	EURASIA	Germany
XENO	XC86686	Gallinago	gallinago	Stein Ø. Nilsen	2013	5-10-2013	EURASIA	Norway
XENO	XC89889	Gallinago	gallinago	vir joshi	2013	11-7-2013	EURASIA	India
XENO	XC90165	Gallinago	gallinago	Volker Arnold	2013	11-13-2013	EURASIA	Germany
XENO	XC90977	Gallinago	gallinago	Lars Lachmann	2013	4-9-2013	EURASIA	Poland
XENO	XC90978	Gallinago	gallinago	Lars Lachmann	2013	10-2-2013	EURASIA	Poland
XENO	XC90979	Gallinago	gallinago	Lars Lachmann	2013	5-28-2013	EURASIA	Poland
XENO	XC91626	Gallinago	gallinago	Lars Lachmann	2013	5-28-2013	EURASIA	Poland
XENO	XC98790	Gallinago	gallinago	Herman van der Meer	2013	9-2-2013	EURASIA	Netherlands

Appendix II: Basic Temporal Measurements of *Gallinago delicata* (Wilson's Snipe) Drum Recordings in Raven

Table A2.1. Information and measurements from Raven for *Gallinago delicata* (Wilson's Snipe) drum recordings including collection name, tape reference number (REF_NO), drum number in the recording (DRUM_NO), inter-drum interval duration (IDI_Dur) (s), the start (DRUM_start) (s) and end (DRUM_end) (s) time of the drum in the recording, the duration of the drum (DRUM_Dur) (s) and the duration of 5 pulses (5-PULSE_DUR) (s), i.e. the 7th to the 3rd from the end of the drum.

COLLECTION	REF_NO	DRUM_NO	IDI_Dur	DRUM_start	DRUM_end	DRUM_Dur	5-PULSE_DUR
AVOCET	AV14588	1	1.635	3.871	6.349	2.478	0.592
AVOCET	AV14588	2	2.648	7.984	11.282	3.298	0.637
AVOCET	AV14588	3	5.228	13.93	17.021	3.091	0.627
AVOCET	AV14588	4		18.127	21.855	3.728	0.617
AVOCET	AV14588	5		22.249	24.535	2.286	0.612
AVOCET	AV14803	1		1.71	4.714	3.004	0.574
AVOCET	AV14803	2		33.769	35.975	2.206	0.521
AVOCET	AV14803	3		41.333	44.317	2.984	0.579
AVOCET	AV14803	4		56.605	59.488	2.883	0.520
AVOCET	AV14803	5		64.273	66.503	2.230	0.526
AVOCET	AV14692	1	10.470	1.132	3.644	2.512	0.480
AVOCET	AV14692	2		14.114	16.506	2.392	0.500
BORROR	17204	1	6.799	5.874	9.779	3.905	0.586
BORROR	17204	2	7.097	16.578	20.928	4.350	0.612
BORROR	17204	3		28.025	31.823	3.798	0.607
BORROR	17204	4		72.112	76.432	4.320	0.597
BORROR	17204	5		96.338	100.091	3.753	0.612
BORROR	17205	1	4.409	13.063	16.173	3.110	0.560
BORROR	17205	2	4.391	20.582	23.246	2.664	0.648
BORROR	17205	3	4.965	27.637	30.542	2.905	0.521

BORROR	17205	4	4.575	35.507	38.784	3.277	0.518
BORROR	17205	5	4.184	43.359	47.028	3.669	0.521
BORROR	17205	6	4.516	51.212	54.202	2.990	0.556
BORROR	17205	7		58.718	61.245	2.527	0.560
BORROR	17205	8		80.674	83.34	2.666	0.533
BORROR	17205	9		113.09	115.435	2.345	0.541
BORROR	17205	10		127.887	130.726	2.839	0.519
BORROR	17205	11		158.525	161.789	3.264	0.565
BORROR	17205	12		203.925	206.559	2.634	0.560
BORROR	17535	1	6.365	5.567	8.804	3.237	0.541
BORROR	17535	2	7.023	15.169	18.76	3.591	0.561
BORROR	17535	3	6.345	25.783	29.319	3.536	0.547
BORROR	17535	4	6.816	35.664	39.007	3.343	0.551
BORROR	17535	5	7.387	45.823	49.596	3.773	0.566
BORROR	17535	6	5.271	56.983	60.251	3.268	0.536
BORROR	17535	7	6.001	65.522	68.516	2.994	0.561
BORROR	17535	8	5.651	74.517	77.678	3.161	0.547
BORROR	17535	9		83.329	86.485	3.156	0.556
BORROR	24021	1	5.038	3.198	6.208	3.010	0.577
BORROR	24021	2	4.847	11.246	13.927	2.681	0.622
BORROR	24021	3		18.774	21.02	2.246	0.552
BORROR	24021	4	4.390	39.843	42.392	2.549	0.581
BORROR	24021	5	5.428	46.782	49.837	3.055	0.607
BORROR	24021	6		55.265	57.708	2.443	0.602
BORROR	9077	1	5.995	41.19	43.572	2.382	
BORROR	9077	2	36.158	49.567	51.954	2.387	
BORROR	9077	3		88.112	91.137	3.025	
BORROR	23973	1		56.483	58.82	2.337	0.619
XENO	XC13808	1	5.515	0.04	2.008	1.968	0.577
XENO	XC13808	2	5.479	7.523	10.386	2.863	0.606

XENO	XC13808	3		15.865	19.274	3.409	0.612
XENO	XC14873	1	11.404	1.406	4.512	3.106	0.582
XENO	XC14873	2	4.430	15.916	18.197	2.281	0.516
XENO	XC14873	3	4.728	22.627	25.52	2.893	0.597
XENO	XC14873	4		30.248	33.728	3.480	0.582
XENO	XC31004	1		1.894	4.142	2.248	0.642
XENO	XC52504	1		26.054	29.483	3.429	0.628
XENO	XC72970	1		2.903	5.72	2.817	0.546
XENO	XC103453	1		8.679	11.036	2.357	0.582
XENO	XC103453	2	6.928	17.964	19.906	1.942	0.587
XENO	XC66908	1		2.013	4.724	2.711	0.576
MLNS	19	1	8.250	15.359	17.62	2.261	0.501
MLNS	19	2		25.87	28.025	2.155	0.405
MLNS	19	3	7.089	32.993	34.925	1.932	0.516
MLNS	19	4	5.236	42.014	44.285	2.271	0.567
MLNS	19	5	1.775	49.521	52.141	2.620	0.618
MLNS	19	6	6.301	53.916	56.657	2.741	0.607
MLNS	19	7		62.958	65.163	2.205	0.576
MLNS	3132	1	13.010	4.458	7.487	3.029	0.622
MLNS	3132	2	3.087	20.497	23.577	3.080	0.597
MLNS	3132	3	5.094	26.664	30.28	3.616	0.592
MLNS	3132	4	5.230	35.374	38.343	2.969	0.576
MLNS	3132	5		43.573	46.79	3.217	0.597
MLNS	3137	1		5.166	7.239	2.073	0.633
MLNS	3141	1	7.280	6.328	9.457	3.129	0.586
MLNS	3141	2	7.220	16.737	19.625	2.888	0.591
MLNS	3141	3	0.661	26.845	29.612	2.767	0.587
MLNS	3141	4	7.820	30.273	32.777	2.504	0.587
MLNS	3141	5		40.597	43.318	2.721	0.602
MLNS	3141	6	7.941	47.719	50.91	3.191	0.592

MLNS	3141	7		58.851	62.043	3.192	0.597
MLNS	3142	1	2.971	5.655	8.477	2.822	0.596
MLNS	3142	2		11.448	14.488	3.040	0.579
MLNS	3142	3	5.391	16.542	19.251	2.709	0.563
MLNS	3142	4		24.642	27.136	2.494	0.604
MLNS	3142	5	2.366	30.428	34.288	3.860	0.587
MLNS	3142	6	1.991	36.654	39.575	2.921	0.588
MLNS	3142	7		41.566	44.957	3.391	0.596
MLNS	3145	1	5.953	6.469	10.049	3.580	0.506
MLNS	3145	2	5.335	16.002	18.915	2.913	0.521
MLNS	3145	3		24.25	27.457	3.207	0.556
MLNS	53197	1	5.812	4.788	7.19	2.402	0.562
MLNS	53197	2	6.512	13.002	16.107	3.105	0.591
MLNS	53197	3	5.905	22.619	24.976	2.357	0.531
MLNS	53197	4	6.344	30.881	33.815	2.934	0.591
MLNS	53197	5		40.159	42.279	2.120	0.567
MLNS	53244	1	7.355	3.957	6.764	2.807	0.531
MLNS	53244	2		14.119	16.901	2.782	0.556
MLNS	53265	1	8.632	5.076	8.399	3.323	0.582
MLNS	53265	2	6.325	17.031	19.605	2.574	0.567
MLNS	53265	3	21.558	25.93	29.445	3.515	0.587
MLNS	53265	4		51.003	53.497	2.494	0.561
MLNS	55582	1	5.896	10.843	13.299	2.456	0.526
MLNS	55582	2		19.195	21.294	2.099	0.516
MLNS	55583	1		9.973	11.582	1.609	0.576
MLNS	55583	2	8.757	34.779	38.146	3.367	0.607
MLNS	55583	3		46.903	50.403	3.500	0.601
MLNS	55583	4		53.556	57.046	3.490	0.622
MLNS	55583	5		66.223	68.645	2.422	0.587
MLNS	55583	6		73.63	76.943	3.313	0.597

MLNS	55583	7		81.491	84.713	3.222	0.597
MLNS	55584	1	5.968	15.084	18.149	3.065	0.567
MLNS	55584	2	6.922	24.117	28.133	4.016	0.577
MLNS	55584	3	6.572	35.055	38.954	3.899	0.597
MLNS	55584	4	4.344	45.526	49.37	3.844	0.607
MLNS	55584	5	7.178	53.714	57.583	3.869	0.586
MLNS	55584	6	5.449	64.761	68.276	3.515	0.576
MLNS	55584	7	6.231	73.725	77.635	3.910	0.577
MLNS	55584	8		83.866	87.811	3.945	0.607
MLNS	55585	1	5.628	11.711	14.68	2.969	0.467
MLNS	55585	2	8.383	20.308	23.357	3.049	0.516
MLNS	55585	3	7.446	31.74	34.628	2.888	0.531
MLNS	55585	4	6.679	42.074	44.881	2.807	0.510
MLNS	55585	5	6.756	51.56	54.367	2.807	0.516
MLNS	55585	6	6.235	61.123	64.137	3.014	0.516
MLNS	55585	7		70.372	73.533	3.161	0.526
MLNS	55588	1	5.486	16.322	20.116	3.794	0.541
MLNS	55588	2	7.721	25.602	29.572	3.970	0.572
MLNS	55588	3	9.258	37.293	39.559	2.266	0.556
MLNS	55588	4	6.166	48.817	51.447	2.630	0.572
MLNS	55588	5	6.687	57.613	61.765	4.152	0.586
MLNS	55588	6	6.601	68.452	72.058	3.606	0.596
MLNS	55588	7		78.659	82.053	3.394	0.581
MLNS	55590	1		15.999	18.846	2.847	0.582
MLNS	55590	2		56.739	59.961	3.222	0.577
MLNS	55590	3	4.660	89.528	92.557	3.029	0.612
MLNS	55590	4	5.919	97.217	100.318	3.101	0.542
MLNS	55590	5	6.072	106.237	108.695	2.458	0.562
MLNS	55590	6		114.767	117.443	2.676	0.592
MLNS	55590	7		137.238	140.146	2.908	0.612

MLNS	55590	8		152.786	155.168	2.382	0.612
MLNS	55590	9		192.858	194.639	1.781	0.556
MLNS	55590	10		203.456	207.159	3.703	0.587
MLNS	55590	11	7.419	253.791	256.557	2.766	0.541
MLNS	55590	12		263.976	267.795	3.819	0.567
MLNS	55590	13		290.22	293.34	3.120	0.602
MLNS	55590	14		331.254	334.299	3.045	0.566
MLNS	56941	1	6.107	9.348	12.043	2.695	0.571
MLNS	56941	2		18.15	20.229	2.079	0.587
MLNS	64217	1	5.566	31.821	35.184	3.363	0.586
MLNS	64217	2	5.600	40.75	44.336	3.586	0.587
MLNS	64217	3	5.832	49.936	53.613	3.677	0.597
MLNS	64217	4	5.744	59.445	62.626	3.181	0.601
MLNS	64217	5	5.595	68.37	71.764	3.394	0.602
MLNS	64217	6	5.429	77.359	81.208	3.849	0.612
MLNS	64217	7	5.677	86.637	90.011	3.374	0.592
MLNS	64217	8	6.437	95.688	98.925	3.237	0.592
MLNS	64217	9	6.677	105.362	109.297	3.935	0.591
MLNS	64217	10	5.791	115.974	119.186	3.212	0.592
MLNS	64217	11	8.461	124.977	128.543	3.566	0.592
MLNS	64217	12	6.411	137.004	139.28	2.276	0.612
MLNS	64217	13	5.421	145.691	149.14	3.449	0.597
MLNS	64217	14	5.689	154.561	158.657	4.096	0.607
MLNS	64217	15	5.652	164.346	167.709	3.363	0.592
MLNS	64217	16	6.008	173.361	176.845	3.484	0.597
MLNS	64217	17	7.313	182.853	188.002	5.149	0.587
MLNS	64217	18	6.150	195.315	198.192	2.877	0.612
MLNS	64217	19	4.398	204.342	208.206	3.864	0.581
MLNS	64217	20	5.409	212.604	216.68	4.076	0.582
MLNS	64217	21	4.881	222.089	226.115	4.026	0.591

MLNS	64217	22	9.180	230.996	234.749	3.753	0.587
MLNS	64217	23	4.903	243.929	246.417	2.488	0.587
MLNS	64217	24	4.833	251.32	254.481	3.161	0.561
MLNS	64217	25	4.459	259.314	263.254	3.940	0.577
MLNS	64217	26	5.429	267.713	271.597	3.884	0.581
MLNS	64217	27	6.035	277.026	280.926	3.900	0.597
MLNS	64217	28	7.700	286.961	291.235	4.274	0.597
MLNS	64217	29	6.658	298.935	301.884	2.949	0.607
MLNS	64217	30	5.693	308.542	311.612	3.070	0.577
MLNS	64217	31	4.543	317.305	321.048	3.743	0.572
MLNS	64217	32	5.513	325.591	329.359	3.768	0.576
MLNS	64217	33	5.829	334.872	339.282	4.410	0.597
MLNS	64217	34	8.912	345.111	348.298	3.187	0.592
MLNS	64217	35	6.715	357.21	360.528	3.318	0.592
MLNS	64217	36	4.919	367.243	370.875	3.632	0.571
MLNS	64217	37	5.616	375.794	380.033	4.239	0.576
MLNS	64217	38	5.649	385.649	389.306	3.657	0.576
MLNS	64217	39	7.482	394.955	399.143	4.188	0.597
MLNS	64217	40		406.625	409.731	3.106	0.597
MLNS	73871	1		8.37	10.97	2.600	0.581
MLNS	73871	2		48.221	50.932	2.711	0.612
MLNS	73871	3		57.939	60.979	3.040	0.617
MLNS	73871	4		68.55	71.473	2.923	0.551
MLNS	73871	5		107.154	109.106	1.952	0.628
MLNS	73871	6		113.797	116.67	2.873	0.627
MLNS	73871	7		117.46	120.879	3.419	0.577
MLNS	73871	8		129.389	132.824	3.435	0.597
MLNS	73871	9		139.738	143.38	3.642	0.606
MLNS	73871	10		171.217	173.295	2.078	0.567
MLNS	73871	11		182.29	185.906	3.616	0.612

MLNS	94348	1	4.034	6.331	9.35	3.019	0.537
MLNS	94348	2	8.536	13.384	18.016	4.632	0.566
MLNS	94348	3	4.740	26.552	28.719	2.167	0.541
MLNS	94348	4	6.845	33.459	36.638	3.179	0.531
MLNS	94348	5	9.209	43.483	45.963	2.480	0.571
MLNS	94348	6	4.991	55.172	57.934	2.762	0.552
MLNS	94348	7	5.692	62.925	65.494	2.569	0.551
MLNS	94348	8		71.186	74.397	3.211	0.556
MLNS	94349	1	4.457	4.166	7.312	3.146	0.516
MLNS	94349	2	5.093	11.769	15.431	3.662	0.524
MLNS	94349	3	6.176	20.524	23.912	3.388	0.541
MLNS	94349	4	5.710	30.088	33.625	3.537	0.499
MLNS	94349	5		39.335	43.147	3.812	0.524
MLNS	94350	1	5.287	5.146	9.475	4.329	0.533
MLNS	94350	2	4.330	14.762	17.085	2.323	0.516
MLNS	94350	3	6.686	21.415	25.102	3.687	0.525
MLNS	94350	4	6.438	31.788	35.933	4.145	0.499
MLNS	94350	5	3.212	42.371	45.059	2.688	0.500
MLNS	94350	6	5.160	48.271	52.84	4.569	0.524
MLNS	94350	7	5.452	58	62.37	4.370	0.525
MLNS	94350	8	3.956	67.822	70.419	2.597	0.541
MLNS	94350	9	6.472	74.375	77.63	3.255	0.525
MLNS	94350	10	5.757	84.102	87.482	3.380	0.525
MLNS	94350	11	5.096	93.239	96.61	3.371	0.532
MLNS	94350	12	5.476	101.706	105.027	3.321	0.508
MLNS	94350	13	5.383	110.503	113.957	3.454	0.500
MLNS	94350	14	6.871	119.34	122.853	3.513	0.533
MLNS	94350	15	5.170	129.724	131.93	2.206	0.516
MLNS	94350	16	6.063	137.1	139.947	2.847	0.524
MLNS	94350	17	5.094	146.01	149.34	3.330	0.491

MLNS	94350	18	8.430	154.434	158.537	4.103	0.533
MLNS	94350	19	6.268	166.967	170.388	3.421	0.524
MLNS	94350	20	4.019	176.656	179.915	3.259	0.532
MLNS	94350	21	5.310	183.934	187.297	3.363	0.525
MLNS	94350	22	8.181	192.607	196.419	3.812	0.541
MLNS	94350	23		204.6	208.037	3.437	0.525
MLNS	105806	1	6.441	7.772	11.917	4.145	0.665
MLNS	105806	2		18.358	23.414	5.056	0.677
MLNS	111120	1	5.269	6.798	9.947	3.149	0.603
MLNS	111120	2	5.672	15.216	18.759	3.543	0.615
MLNS	111120	3	5.554	24.431	30.299	5.868	0.627
MLNS	111120	4	6.105	35.853	39.605	3.752	0.615
MLNS	111120	5	5.279	45.71	48.749	3.039	0.615
MLNS	111120	6	5.640	54.028	57.042	3.014	0.615
MLNS	111120	7	6.116	62.682	65.819	3.137	0.603
MLNS	111120	8	5.190	71.935	75.503	3.568	0.615
MLNS	111120	9		80.693	84.446	3.753	0.628
MLNS	111120	10	5.598	88.681	91.929	3.248	0.615
MLNS	111120	11	6.007	97.527	100.726	3.199	0.615
MLNS	111120	12	6.107	106.733	109.845	3.112	0.628
MLNS	111120	13	5.485	115.952	119.778	3.826	0.627
MLNS	111120	14	11.838	125.263	128.696	3.433	0.627
MLNS	111120	15	5.152	140.534	144.015	3.481	0.615
MLNS	111120	16	5.009	149.167	152.574	3.407	0.640
MLNS	111120	17	5.588	157.583	160.843	3.260	0.591
MLNS	111120	18	4.750	166.431	170.011	3.580	0.615
MLNS	111120	19	4.740	174.761	178.636	3.875	0.628
MLNS	111120	20		183.376	187.104	3.728	0.628
MLNS	111120	21	5.522	188.79	192.075	3.285	0.615
MLNS	111120	22	5.278	197.597	200.993	3.396	0.602

MLNS	111120	23	5.445	206.271	210.319	4.048	0.628
MLNS	111120	24	5.309	215.764	219.491	3.727	0.628
MLNS	111120	25		224.8	228.38	3.580	0.627
MLNS	111126	1	6.728	7.118	10.267	3.149	0.652
MLNS	111126	2	8.046	16.995	20.021	3.026	0.615
MLNS	111126	3	6.203	28.067	30.343	2.276	0.603
MLNS	111126	4	4.935	36.546	40.015	3.469	0.640
MLNS	111126	5	4.833	44.95	48.333	3.383	0.628
MLNS	111126	6	5.961	53.166	56.438	3.272	0.603
MLNS	111126	7	6.178	62.399	65.475	3.076	0.615
MLNS	111126	8		71.653	73.388	1.735	0.590
MLNS	111126	9	5.258	117.874	120.974	3.100	0.616
MLNS	111126	10		126.232	129.468	3.236	0.628
MLNS	136370	1	7.278	5.383	9.157	3.774	0.647
MLNS	136370	2	6.249	16.435	19.055	2.62	0.647
MLNS	136370	3	4.582	25.304	28.407	3.103	0.615
MLNS	136370	4	10.257	32.989	36.353	3.364	0.637
MLNS	136370	5	4.505	46.61	50.351	3.741	0.636
MLNS	136370	6	5.867	54.856	58.577	3.721	0.658
MLNS	136370	7	5.293	64.444	67.431	2.987	0.636
MLNS	136370	8	5.699	72.724	76.207	3.483	0.637
MLNS	136370	9	8.032	81.906	85.017	3.111	0.637
MLNS	136370	10		93.049	95.913	2.864	0.636
MLNS	136370	11	6.997	104.462	106.644	2.182	0.626
MLNS	136370	12	5.977	113.641	116.172	2.531	0.625
MLNS	136370	13	6.422	122.149	125.651	3.502	0.626
MLNS	136370	14		132.073	135.013	2.94	0.626
MLNS	136370	15	3.263	134.627	137.115	2.488	0.637
MLNS	136370	16		140.378	143.866	3.488	0.636
MLNS	136370	17	6.434	143.747	146.32	2.573	0.637

MLNS	136370	18	1.076	152.754	154.808	2.054	0.615
MLNS	136370	19	5.904	155.884	158.271	2.387	0.658
MLNS	136370	20	6.404	164.175	166.677	2.502	0.636
MLNS	136370	21	4.476	173.081	175.297	2.216	0.636
MLNS	136370	22	5.697	179.773	182.384	2.611	0.658
MLNS	136370	23	6.002	188.081	191.979	3.898	0.647
MLNS	136370	24	5.632	197.981	201.131	3.15	0.647
MLNS	136370	25		206.763	209.594	2.831	0.615
MLNS	137554	1	4.479	5.851	9.85	3.999	0.637
MLNS	137554	2	6.29	14.329	17.595	3.266	0.637
MLNS	137554	3	6.474	23.885	26.292	2.407	0.647
MLNS	137554	4	4.621	32.766	34.919	2.153	0.626
MLNS	137554	5	5.376	39.54	42.521	2.981	0.647
MLNS	137554	6	5.375	47.897	50.926	3.029	0.637
MLNS	137554	7	0.114	56.301	59.417	3.116	0.647
MLNS	137554	8		59.531	61.21	1.679	0.625
MLNS	172367	1	3.937	5.896	8.177	2.281	0.521
MLNS	172367	2	5.315	12.114	15.255	3.141	0.576
MLNS	172367	3	5.164	20.57	23.498	2.928	0.541
MLNS	172367	4	4.382	28.662	31.611	2.949	0.541
MLNS	172367	5	4.486	35.993	39.256	3.263	0.562
MLNS	172367	6	5.03	43.742	46.964	3.222	0.567
MLNS	172367	7	5.096	51.994	54.917	2.923	0.577
MLNS	172367	8	4.795	60.013	62.749	2.736	0.531
MLNS	172367	9	4.995	67.544	70.392	2.848	0.536
MLNS	172367	10	4.905	75.387	78.452	3.065	0.556
MLNS	172367	11		83.357	86.513	3.156	0.562
MLNS	3133	1		5.219	6.725	1.506	0.636
MLNS	3134	1	6.5	4.673	6.826	2.153	0.573
MLNS	3134	2	6.201	13.326	15.713	2.387	0.583

MLNS	3134	3	5.238	21.914	24.364	2.45	0.541
MLNS	3134	4		29.602	33.112	3.51	0.584
MLNS	42573	1		14.187	17.598	3.411	0.521
MLNS	42574	1		17.309	19.894	2.585	0.53
MLNS	78506	1	11.366	23.481	25.247	1.766	0.567
MLNS	78506	2		36.613	38.869	2.256	0.581
MLNS	45381	1	5.191	22.67	25.578	2.908	0.592
MLNS	45381	2	5.493	30.769	31.543	0.774	0.577
MLNS	45381	3	6.172	37.036	39.565	2.529	0.581
MLNS	45381	4	5.952	45.737	48.6	2.863	0.602
MLNS	45381	5		54.552	56.834	2.282	0.551
MLNS	45389	1	31.354	42.857	45.286	2.429	0.521
MLNS	45389	2		76.64	78.899	2.259	0.562
MLNS	50323	1		10.069	13.143	3.074	0.538
MLNS	55581	1	9.964	56.41	58.939	2.529	0.562
MLNS	55581	2	8.346	68.903	71.898	2.995	0.57
MLNS	55581	3	7.685	80.244	83.575	3.331	0.57
MLNS	55581	4		91.26	95.161	3.901	0.562
MLNS	55581	5	7.128	112.832	115.353	2.521	0.562
MLNS	55581	6	6.67	122.481	126.318	3.837	0.554
MLNS	55581	7	9.893	132.988	136.89	3.902	0.578
MLNS	55581	8	8.478	146.783	149.882	3.099	0.578
MLNS	55581	9	9.688	158.36	162.076	3.716	0.578
MLNS	55581	10	7.169	171.764	175.97	4.206	0.586
MLNS	55581	11	9.859	183.139	186.037	2.898	0.578
MLNS	55581	12	9.206	195.896	198.569	2.673	0.602
MLNS	55581	13	8.651	207.775	210.801	3.026	0.594
MLNS	55581	14	7.057	219.452	221.78	2.328	0.562
MLNS	55581	15	6.64	228.837	231.141	2.304	0.562
MLNS	55581	16	7.347	237.781	241.674	3.893	0.578

MLNS	55581	17		249.021	253.155	4.134	0.586
MLNS	106803	1	9.064	7.831	10.753	2.922	0.65
MLNS	106803	2	7.169	19.817	22.442	2.625	0.618
MLNS	106803	3	8.32	29.611	32.02	2.409	0.61
MLNS	106803	4		40.34	42.989	2.649	0.602
MLNS	106804	1		53.392	56.539	3.147	0.642
MLNS	136363	1	0.121	14.427	15.682	1.255	0.597
MLNS	136363	2		15.803	17.138	1.335	0.556
MLNS	136413	1	1.303	24.656	26.919	2.263	0.602
MLNS	136413	2	0.795	28.222	30.285	2.063	0.521
MLNS	136413	3	1.164	31.08	34.051	2.971	0.577
MLNS	136413	4	2.76	35.215	37.238	2.023	0.557
MLNS	136413	5	12.518	39.998	41.772	1.774	0.551
MLNS	136413	6	6.085	54.29	56.699	2.409	0.572
MLNS	136413	7	4.886	62.784	65.429	2.645	0.561
MLNS	136413	8	5.577	70.315	72.735	2.42	0.562
MLNS	136413	9	51.034	78.312	80.214	1.902	0.572
MLNS	136413	10	5.255	131.248	133.634	2.386	0.561
MLNS	136413	11		138.889	141.905	3.016	0.566
MLNS	137550	1	15.606	49.759	52.191	2.432	0.537
MLNS	137550	2	0.015	67.797	70.575	2.778	0.586
MLNS	137550	3	12.163	70.59	72.894	2.304	0.602
MLNS	137550	4	12.683	85.057	87.955	2.898	0.554
MLNS	137550	5	7.321	100.638	104.138	3.5	0.594
MLNS	137550	6	4.992	111.459	114.124	2.665	0.586
MLNS	137550	7		119.116	121.211	2.095	0.562
NEVILLE	002	1	10.243	2.625	5.569	2.944	0.612
NEVILLE	002	2	8.514	15.812	18.599	2.787	0.601
NEVILLE	002	3	14.077	27.113	29.723	2.610	0.607
NEVILLE	002	4	3.112	43.8	46.911	3.111	0.592

NEVILLE	002	5	15.530	50.023	54.696	4.673	0.612
NEVILLE	002	6	15.850	70.226	73.463	3.237	0.607
NEVILLE	002	7	5.800	89.313	91.347	2.034	0.672
NEVILLE	002	8	0.659	97.147	99.337	2.190	0.582
NEVILLE	002	9	18.025	99.996	101.968	1.972	0.622
NEVILLE	002	10	5.097	119.993	123.033	3.040	0.602
NEVILLE	002	11	5.578	128.13	132.91	4.780	0.678
NEVILLE	002	12	7.216	138.488	141.816	3.328	0.668
NEVILLE	002	13	12.393	149.032	152.85	3.818	0.663
NEVILLE	002	14		165.243	167.808	2.565	0.526
FLMNH	05451	1		12.274	15.42	3.146	0.582
FLMNH	05377	1	2.473	22.676	25.321	2.645	0.536
FLMNH	05377	2		27.794	30.449	2.655	0.526
FLMNH	05400	1		11.606	14.686	3.080	0.560
FLMNH	06637	1	9.118	9.856	12.461	2.605	0.496
FLMNH	06637	2	31.137	21.579	23.759	2.180	0.521
FLMNH	06637	3		54.896	57.043	2.147	0.556
FLMNH	07309	1	11.897	8.493	11.417	2.924	0.711
FLMNH	07309	2	5.767	23.314	26.571	3.257	0.700
FLMNH	07309	3	5.717	32.338	34.199	1.861	0.724
FLMNH	07309	4	2.794	39.916	43.431	3.515	0.712
FLMNH	07309	5		46.225	49.953	3.728	0.735
FLMNH	11513	1		21.345	25.55	4.205	0.592
FLMNH	11513	2	2.789	24.42	26.798	2.378	0.546
FLMNH	11513	3	3.220	29.587	33.491	3.904	0.577
FLMNH	11513	4	0.531	36.711	38.051	1.340	0.632
FLMNH	11513	5	2.898	38.582	41.334	2.752	0.632
FLMNH	11513	6	1.067	44.232	47.363	3.131	0.602
FLMNH	11513	7	0.014	48.43	51.105	2.675	0.618
FLMNH	11513	8	3.878	51.119	53.784	2.665	0.572

FLMNH	11513	9	3.088	57.662	63.159	5.497	0.637
FLMNH	11513	10	0.028	66.247	69.818	3.571	0.622
FLMNH	11513	11	2.656	69.846	73.062	3.216	0.557
FLMNH	11513	12	0.034	75.718	79.011	3.293	0.622
FLMNH	11513	13	2.158	79.045	82.358	3.313	0.552
FLMNH	11513	14	4.512	84.516	87.692	3.176	0.628
FLMNH	11513	15	5.154	92.204	95.249	3.045	0.627
FLMNH	11513	16	3.106	100.403	102.224	1.821	0.531
FLMNH	11513	17		105.33	109.158	3.828	0.637
FLMNH	22253	1	9.286	5.736	9.123	3.387	0.545
FLMNH	22253	2	9.134	18.409	21.761	3.352	0.534
FLMNH	22253	3	5.018	30.895	33.43	2.535	0.545
FLMNH	22253	4	7.802	38.448	41.505	3.057	0.557
FLMNH	22253	5		49.307	51.796	2.489	0.546
FLMNH	23065	1	6.145	1.443	5.33	3.887	0.602
FLMNH	23065	2	2.909	11.475	15.281	3.806	0.591
FLMNH	23065	3	6.876	18.19	20.474	2.284	0.523
FLMNH	23065	4	6.796	27.35	30.362	3.012	0.636
FLMNH	23065	5	1.591	37.158	41.147	3.989	0.579
FLMNH	23065	6	6.636	42.738	46.568	3.830	0.580
FLMNH	23065	7	0.773	53.204	57.068	3.864	0.579
FLMNH	23065	8	0.471	57.841	62.216	4.375	0.591
FLMNH	23065	9	0.747	62.687	65.994	3.307	0.591
FLMNH	23065	10	0.452	66.741	70.729	3.988	0.557
FLMNH	23065	11	0.739	71.181	75.124	3.943	0.602
FLMNH	23065	12		75.863	79.761	3.898	0.590
EHM	Flicek_1978_01_01	1	5.445	3.674	7.578	3.904	0.551
EHM	Flicek_1978_01_01	2	4.589	13.023	16.768	3.745	0.544
EHM	Flicek_1978_01_01	3	4.658	21.357	25.374	4.017	0.521
EHM	Flicek_1978_01_01	4	5.069	30.032	34.261	4.229	0.513

EHM	Flicek_1978_01_01	5	5.667	39.33	43.634	4.304	0.528
EHM	Flicek_1978_01_01	6	6.034	49.301	53.198	3.897	0.559
EHM	Flicek_1978_01_01	7	5.555	59.232	63.174	3.942	0.544
EHM	Flicek_1978_01_01	8	5.440	68.729	72.965	4.236	0.544
EHM	Flicek_1978_01_01	9	5.033	78.405	82.754	4.349	0.536
EHM	Flicek_1978_01_01	10	4.368	87.787	92.363	4.576	0.521
EHM	Flicek_1978_01_01	11	5.377	96.731	100.952	4.221	0.514
EHM	Flicek_1978_01_01	12	5.530	106.329	110.935	4.606	0.544
EHM	Flicek_1978_01_01	13	6.282	116.465	120.361	3.896	0.551
EHM	Flicek_1978_01_01	14	4.015	126.643	131.113	4.470	0.544
EHM	Flicek_1978_01_01	15	5.275	135.128	140.753	5.625	0.543
EHM	Flicek_1978_01_01	16	5.574	146.028	150.173	4.145	0.529
EHM	Flicek_1978_01_01	17		155.747	159.954	4.207	0.521
EHM	Flicek_1978_07_01	1	4.821	0.74	5.399	4.659	0.544
EHM	Flicek_1978_07_01	2	4.362	10.22	14.584	4.364	0.536
EHM	Flicek_1978_07_01	3	4.657	18.946	23.197	4.251	0.513
EHM	Flicek_1978_07_01	4	5.035	27.854	32.09	4.236	0.514
EHM	Flicek_1978_07_01	5	5.002	37.125	41.452	4.327	0.529
EHM	Flicek_1978_07_01	6	6.041	46.454	51.015	4.561	0.559
EHM	Flicek_1978_07_01	7	5.575	57.056	60.998	3.942	0.551
EHM	Flicek_1978_07_01	8	5.427	66.573	70.779	4.206	0.543
EHM	Flicek_1978_07_01	9	5.475	76.206	80.578	4.372	0.529
EHM	Flicek_1978_07_01	10	4.869	86.053	89.647	3.594	0.514
EHM	Flicek_1978_07_01	11	5.490	94.516	98.767	4.251	0.513
EHM	Flicek_1978_07_01	12	5.103	104.257	108.742	4.485	0.544
EHM	Flicek_1978_07_01	13	6.252	113.845	118.202	4.357	0.559
EHM	Flicek_1978_07_01	14	5.226	124.454	128.94	4.486	0.536
EHM	Flicek_1978_07_01	15	5.831	134.166	138.576	4.410	0.544
EHM	Flicek_1978_07_01	16	6.219	144.407	148.017	3.610	0.536
EHM	Flicek_1978_07_01	17		154.236	157.694	3.458	0.521

EHM	Flicek_1978_08_01	1	4.702	10.42	14.543	4.123	0.589
EHM	Flicek_1978_08_01	2	5.728	19.245	23.066	3.821	0.589
EHM	Flicek_1978_08_01	3	6.068	28.794	31.951	3.157	0.582
EHM	Flicek_1978_08_01	4	5.140	38.019	41.266	3.247	0.566
EHM	Flicek_1978_08_01	5	5.482	46.406	49.276	2.870	0.559
EHM	Flicek_1978_08_01	6	4.975	54.758	58.118	3.360	0.566
EHM	Flicek_1978_08_01	7	5.276	63.093	66.446	3.353	0.582
EHM	Flicek_1978_08_01	8	5.134	71.722	75.429	3.707	0.589
EHM	Flicek_1978_08_01	9	11.971	80.563	84.527	3.964	0.612
EHM	Flicek_1978_08_01	10	4.693	96.498	100.146	3.648	0.566
EHM	Flicek_1978_08_01	11		104.839	108.23	3.391	0.581
EHM	Flicek_1978_12_01	1	2.721	3.179	5.497	2.318	0.559
EHM	Flicek_1978_12_01	2	3.988	8.218	10.763	2.545	0.574
EHM	Flicek_1978_12_01	3	5.342	14.751	17.069	2.318	0.559
EHM	Flicek_1978_12_01	4	4.892	22.411	24.843	2.432	0.544
EHM	Flicek_1978_12_01	5	6.898	29.735	33.05	3.315	0.566
EHM	Flicek_1978_12_01	6	3.549	39.948	42.432	2.484	0.581
EHM	Flicek_1978_12_01	7	2.829	45.981	48.964	2.983	0.567
EHM	Flicek_1978_12_01	8	5.536	51.793	54.353	2.560	0.551
EHM	Flicek_1978_12_01	9	6.842	59.889	62.766	2.877	0.537
EHM	Flicek_1978_12_01	10	5.840	69.608	72.477	2.869	0.573
EHM	Flicek_1978_12_01	11		78.317	81.028	2.711	0.589
EHM	Flicek_1978_12_02	1	6.070	2.228	5.324	3.096	0.536
EHM	Flicek_1978_12_02	2		11.394	14.309	2.915	0.566
EHM	Flicek_1978_12_03	1	10.578	3.519	6.411	2.892	0.589
EHM	Flicek_1978_12_03	2	8.725	16.989	19.451	2.462	0.566
EHM	Flicek_1978_12_03	3	5.741	28.176	31.106	2.930	0.558
EHM	Flicek_1978_12_03	4		36.847	40.66	3.813	0.619
EHM	Flicek_1978_01_02	1	4.770	2.937	5.339	2.402	0.567
EHM	Flicek_1978_01_02	2	5.816	10.109	13.771	3.662	0.597

EHM	Flicek_1978_01_02	3	7.472	19.587	22.812	3.225	0.597
EHM	Flicek_1978_01_02	4	8.501	30.284	32.051	1.767	0.551
EHM	Flicek_1978_01_02	5	22.406	40.552	41.549	0.997	0.544
EHM	Flicek_1978_01_02	6	14.905	63.955	66.069	2.114	0.574
EHM	Flicek_1978_01_02	7	17.697	80.974	83.307	2.333	0.589
EHM	Flicek_1978_01_02	8	5.592	101.004	103.299	2.295	0.574
EHM	Flicek_1978_01_02	9	5.844	108.891	110.968	2.077	0.559
EHM	Flicek_1978_01_02	10	6.583	116.812	119.644	2.832	0.544
EHM	Flicek_1978_01_02	11		126.227	128.356		0.559
EHM	Flicek_1978_07_02	1	4.878	6.187	8.369	2.182	0.574
EHM	Flicek_1978_07_02	2	5.835	13.247	16.788	3.541	0.604
EHM	Flicek_1978_07_02	3	7.280	22.623	25.832	3.209	0.596
EHM	Flicek_1978_07_02	4	8.427	33.112	35.173	2.061	0.543
EHM	Flicek_1978_07_02	5	21.865	43.6	44.574	0.974	0.544
EHM	Flicek_1978_07_02	6	14.792	66.439	69.112	2.673	0.566
EHM	Flicek_1978_07_02	7	7.405	83.904	86.373	2.469	0.589
EHM	Flicek_1978_07_02	8	7.943	93.778	96.111	2.333	0.589
EHM	Flicek_1978_07_02	9	5.019	104.054	106.373	2.319	0.551
EHM	Flicek_1978_07_02	10	5.838	111.392	114.02	2.628	0.551
EHM	Flicek_1978_07_02	11	6.369	119.858	122.893	3.035	0.551
EHM	Flicek_1978_07_02	12		129.262	131.43	2.168	0.559
EHM	Flicek_1978_08_02	1	4.698	3.918	7.535	3.617	0.566
EHM	Flicek_1978_08_02	2	18.131	12.233	15.608	3.375	0.581
EHM	Flicek_1978_08_02	3	7.234	33.739	37.092	3.353	0.574
EHM	Flicek_1978_08_02	4	5.738	44.326	47.513	3.187	0.551
EHM	Flicek_1978_08_02	5	5.489	53.251	55.977	2.726	0.574
EHM	Flicek_1978_08_02	6	5.154	61.466	63.664	2.198	0.559
EHM	Flicek_1978_08_02	7	5.421	68.818	71.461	2.643	0.543
EHM	Flicek_1978_08_02	8	0.494	76.882	80.862	3.980	0.589
EHM	Flicek_1978_08_02	9	1.203	81.356	84.082	2.726	0.529

EHM	Flicek_1978_08_02	10	5.667	85.285	89.143	3.858	0.604
EHM	Flicek_1978_08_02	11	7.234	94.81	98.276	3.466	0.612
EHM	Flicek_1978_08_02	12	5.317	105.51	108.273	2.763	0.551
EHM	Flicek_1978_08_02	13	4.742	113.59	115.999	2.409	0.544
EHM	Flicek_1978_08_02	14	5.247	120.741	123.913	3.172	0.559
EHM	Flicek_1978_08_02	15	5.050	129.16	132.49	3.330	0.559
EHM	Flicek_1978_08_02	16		137.54	141.965	4.425	0.582
EHM	Haines_1983_01_01	1		5.02	6.274	1.254	0.574
EHM	Nunivak_1988_08_01	1		14.46	17.556	3.096	0.582
EHM	Hat_Creek_92-23	1	11.046	10.02	12.324	2.304	0.423
EHM	Hat_Creek_92-23	2		23.37	26.994	3.624	0.604
EHM	Middleton_2003_07_01	1	4.144	3.267	7.873	4.606	0.582
EHM	Middleton_2003_07_01	2	8.133	12.017	17.137	5.120	0.574
EHM	Middleton_2003_07_01	3	5.581	25.27	28.14	2.870	0.558
EHM	Middleton_2003_07_01	4	6.552	33.721	36.756	3.035	0.574
EHM	Middleton_2003_07_01	5	16.547	43.308	45.951	2.643	0.559
EHM	Middleton_2003_07_01	6	5.378	62.498	65.707	3.209	0.582
EHM	Middleton_2003_07_01	7	4.281	71.085	73.698	2.613	0.567
EHM	Middleton_2003_07_01	8	1.604	77.979	80.856	2.877	0.589
EHM	Middleton_2003_07_01	9	3.219	82.46	86.176	3.716	0.581
EHM	Middleton_2003_07_01	10	1.328	89.395	92.03	2.635	0.513
EHM	Middleton_2003_07_01	11	3.147	93.358	96.673	3.315	0.559
EHM	Middleton_2003_07_01	12	11.804	99.82	103.074	3.254	0.559
EHM	Middleton_2003_07_01	13	9.227	114.878	117.597	2.719	0.559
EHM	Middleton_2003_07_01	14	7.764	126.824	129.241	2.417	0.559
EHM	Middleton_2003_07_01	15		137.005	139.603	2.598	0.566
EHM	Middleton_2003_07_02	1	7.293	2.318	4.282	1.964	0.566
EHM	Middleton_2003_07_02	2	5.823	11.575	14.747	3.172	0.566
EHM	Middleton_2003_07_02	3	1.655	20.57	23.863	3.293	0.574
EHM	Middleton_2003_07_02	4	0.759	25.518	29.044	3.526	0.559

EHM	Middleton_2003_07_02	5	4.438	29.803	32.952	3.149	0.574
EHM	Middleton_2003_07_02	6	1.790	37.39	40.585	3.195	0.574
EHM	Middleton_2003_07_02	7	4.001	42.375	44.807	2.432	0.582
EHM	Middleton_2003_07_02	8	0.281	48.808	51.685	2.877	0.559
EHM	Middleton_2003_07_02	9	6.244	51.966	55.024	3.058	0.574
EHM	Middleton_2003_07_02	10	6.253	61.268	64.409	3.141	0.566
EHM	Middleton_2003_07_02	11	6.746	70.662	73.471	2.809	0.574
EHM	Middleton_2003_07_02	12		80.217	82.86	2.643	0.589
EHM	Middleton_2003_07_03	1	5.306	11.434	14.424	2.990	0.521
EHM	Middleton_2003_07_03	2	13.149	19.73	22.556	2.826	0.521
EHM	Middleton_2003_07_03	3	2.332	35.705	38.491	2.786	0.506
EHM	Middleton_2003_07_03	4	0.034	40.823	44.311	3.488	0.544
EHM	Middleton_2003_07_03	5	5.908	44.345	47.539	3.194	0.528
EHM	Middleton_2003_07_03	6	4.726	53.447	56.928	3.481	0.513
EHM	Middleton_2003_07_03	7	13.769	61.654	64.229	2.575	0.521
EHM	Middleton_2003_07_03	8	9.149	77.998	80.354	2.356	0.513
EHM	Middleton_2003_07_03	9	8.353	89.503	92.19	2.687	0.521
EHM	Middleton_2003_07_03	10	3.996	100.543	102.499	1.956	0.506
EHM	Middleton_2003_07_03	11	5.580	106.495	109.878	3.383	0.528
EHM	Middleton_2003_07_03	12	12.526	115.458	117.98	2.522	0.514
EHM	Middleton_2003_07_03	13	1.814	130.506	133.217	2.711	0.529
EHM	Middleton_2003_07_03	14	0.611	135.031	137.787	2.756	0.627
EHM	Middleton_2003_07_03	15		138.398	141.018	2.620	0.521
EHM	Middleton_2003_07_04	1	1.709	8.312	10.917	2.605	0.521
EHM	Middleton_2003_07_04	2	0.638	12.626	15.473	2.847	0.634
EHM	Middleton_2003_07_04	3	13.738	16.111	18.837	2.726	0.521
EHM	Middleton_2003_07_04	4		32.575	35.362	2.787	0.514
EHM	Middleton_2003_07_05	1	7.613	4.01	6.819	2.809	0.626
EHM	Middleton_2003_07_05	2		14.432	17.716	3.284	0.641
EHM	Middleton_2003_07_05	3		58.616	61.047	2.431	0.612

EHM	Middleton_2003_07_05	4	8.070	102.68	105.126	2.446	0.634
EHM	Middleton_2003_07_05	5	15.579	113.196	115.982	2.786	0.642
EHM	Middleton_2003_07_05	6		131.561	134.325	2.764	0.626
EHM	Middleton_2003_07_06	1	75.875	16.981	19.722	2.741	0.627
EHM	Middleton_2003_07_06	2		95.597	98.889	3.292	0.634
EHM	Middleton_2003_07_07	1	6.559	9.156	12.803	3.647	0.642
EHM	Middleton_2003_07_07	2		19.362	21.567	2.205	0.612
EHM	Middleton_2003_07_07	3	5.758	49.322	53.642	4.320	0.635
EHM	Middleton_2003_07_07	4	7.262	59.4	61.915	2.515	0.612
EHM	Middleton_2003_07_07	5	5.639	69.177	72.387	3.210	0.650
EHM	Middleton_2003_07_07	6		78.026	81.168	3.142	0.612
EHM	Middleton_2003_07_08	1		9.774	12.092	2.318	0.536
EHM	Middleton_2003_07_08	2	6.028	63.395	66.612	3.217	0.521
EHM	Middleton_2003_07_08	3	6.322	72.64	75.691	3.051	0.537
EHM	Middleton_2003_07_08	4	6.420	82.013	84.837	2.824	0.536
EHM	Middleton_2003_07_08	5	6.682	91.257	93.968	2.711	0.537
EHM	Middleton_2003_07_08	6		100.65	104.116	3.466	0.528
EHM	Middleton_2003_07_09	1	6.686	8.036	10.755	2.719	0.529
EHM	Middleton_2003_07_09	2		17.441	20.892	3.451	0.536
EHM	Middleton_2003_07_09	3	6.147	104.645	108.217	3.572	0.531
EHM	Middleton_2003_07_09	4	8.366	114.364	117.513	3.149	0.526
EHM	Middleton_2003_07_09	5		125.879	129.246	3.367	0.511
EHM	Middleton_2003_07_11	1	5.933	15.307	17.958	2.651	0.591
EHM	Middleton_2003_07_11	2	5.302	23.891	27.092	3.201	0.572
EHM	Middleton_2003_07_11	3	13.903	32.394	35.22	2.826	0.586
EHM	Middleton_2003_07_11	4	14.080	49.123	52.191	3.068	0.586
EHM	Middleton_2003_07_11	5	6.957	66.271	68.936	2.665	0.586
EHM	Middleton_2003_07_11	6	5.188	75.893	78.502	2.609	0.570
EHM	Middleton_2003_07_11	7	51.197	83.69	87.158	3.468	0.586
EHM	Middleton_2003_07_11	8	8.578	138.355	141.466	3.111	0.610

EHM	Middleton_2003_07_11	9		150.044	152.942	2.898	0.570
EHM	Middleton_2003_07_12	1	16.093	7.078	9.318	2.240	0.581
EHM	Middleton_2003_07_12	2	8.219	25.411	27.795	2.384	0.531
EHM	Middleton_2003_07_12	3	2.132	36.014	38.791	2.777	0.562
EHM	Middleton_2003_07_12	4	0.006	40.923	43.846	2.923	0.612
EHM	Middleton_2003_07_12	5		43.852	46.775	2.923	0.577
EHM	SEBC_1991_01_01	1	2.022	0.811	3.372	2.561	0.626
EHM	SEBC_1991_01_01	2	5.832	5.394	7.377	1.983	0.618
EHM	SEBC_1991_01_01	3	7.373	13.209	16.805	3.596	0.634
EHM	SEBC_1991_01_01	4	7.124	24.178	27.173	2.995	0.642
EHM	SEBC_1991_01_01	5	6.096	34.297	37.46	3.163	0.610
EHM	SEBC_1991_01_01	6	6.230	43.556	46.743	3.187	0.602
EHM	SEBC_1991_01_01	7	8.555	52.973	56.489	3.516	0.618
EHM	SEBC_1991_01_01	8	6.544	65.044	68.055	3.011	0.610
EHM	SEBC_1991_01_01	9	8.400	74.599	78.228	3.629	0.618
EHM	SEBC_1991_01_01	10	7.341	86.628	89.991	3.363	0.594
EHM	SEBC_1991_01_01	11	5.925	97.332	100.366	3.034	0.618
EHM	SEBC_1991_01_01	12		106.291	109.108	2.817	0.626
EHM	SEBC_1991_01_02	1	7.558	49.724	52.461	2.737	0.602
EHM	SEBC_1991_01_02	2		60.019	62.725	2.706	0.602
EHM	SEBC_1991_01_03	1	6.949	5.266	7.883	2.617	0.607
EHM	SEBC_1991_01_03	2	20.079	14.832	18.533	3.701	0.629
EHM	SEBC_1991_01_03	3	7.963	38.612	40.988	2.376	0.608
EHM	SEBC_1991_01_03	4	23.349	48.951	52.01	3.059	0.629
EHM	SEBC_1991_01_03	5	9.954	75.359	77.57	2.211	0.618
EHM	SEBC_1991_01_03	6	8.603	87.524	90.018	2.494	0.597
EHM	SEBC_1991_01_03	7	12.917	98.621	101.387	2.766	0.607
EHM	SEBC_1991_01_03	8	8.973	114.304	116.725	2.421	0.618
EHM	SEBC_1991_01_03	9		125.698	127.92	2.222	0.587
EHM	SEBC_1991_01_04	1	12.484	1.352	3.364	2.012	0.582

EHM	SEBC_1991_01_04	2	9.388	15.848	18.16	2.312	0.612
EHM	SEBC_1991_01_04	3	8.142	27.548	30.547	2.999	0.617
EHM	SEBC_1991_01_04	4	19.611	38.689	41.683	2.994	0.612
EHM	SEBC_1991_01_04	5	8.938	61.294	65.102	3.808	0.622
EHM	SEBC_1991_01_04	6	7.655	74.04	76.786	2.746	0.606
EHM	SEBC_1991_01_04	7	4.653	84.441	87.319	2.878	0.612
EHM	SEBC_1991_01_04	8	20.907	91.972	94.966	2.994	0.617
EHM	SEBC_1991_01_04	9	20.375	115.873	118.978	3.105	0.612
EHM	SEBC_1991_01_04	10		139.353	141.639	2.286	0.602
EHM	SEBC_1991_01_06	1		12.27	14.753	2.483	0.612
EHM	SEBC_1991_02_01	1	26.472	2.332	5.503	3.171	0.531
EHM	SEBC_1991_02_01	2		31.975	34.646	2.671	0.536
EHM	SEBC_1991_02_02	1	12.747	2.767	5.245	2.478	0.500
EHM	SEBC_1991_02_02	2	12.531	17.992	20.547	2.555	0.551
EHM	SEBC_1991_02_02	3		33.078	35.435	2.357	0.587
EHM	SEBC_1991_02_03	1	19.704	1.082	3.991	2.909	0.554
EHM	SEBC_1991_02_03	2		23.695	26.952	3.257	0.577
EHM	SEBC_1991_02_04	1	16.083	17.367	19.102	1.735	0.546
EHM	SEBC_1991_02_04	2		35.185	37.41	2.225	0.570
EHM	SEBC_1991_02_05	1	14.948	35.066	37.145	2.079	0.617
EHM	SEBC_1991_02_05	2		52.093	55.135	3.042	0.597
EHM	SEBC_1991_02_07	1	5.822	0.755	3.083	2.328	0.516
EHM	SEBC_1991_02_07	2	4.758	8.905	12.389	3.484	0.556
EHM	SEBC_1991_02_07	3	6.638	17.147	20.197	3.050	0.551
EHM	SEBC_1991_02_07	4	4.790	26.835	28.954	2.119	0.536
EHM	SEBC_1991_02_07	5		33.744	36.513	2.769	0.566
EHM	SEBC_1991_03_03	1		13.716	16.687	2.971	0.465
EHM	SEBC_1991_03_03	2		49.641	51.343	1.702	0.607
EHM	SEBC_1991_03_03	3		56.951	60.435	3.484	0.622
EHM	SEBC_1991_03_03	4		97.39	99.798	2.408	0.612

EHM	SEBC_1991_03_04	1	8.201	3.701	5.916	2.215	0.622
EHM	SEBC_1991_03_04	2	5.970	14.117	15.787	1.670	0.601
EHM	SEBC_1991_03_04	3		21.757	24.824	3.067	0.562
EHM	SEBC_1991_03_05	1		3.396	6.575	3.179	0.562
EHM	SEBC_1991_03_05	2		24.346	27.401	3.055	0.602
EHM	SEBC_1991_03_06	1	6.055	9.085	13.182	4.097	0.612
EHM	SEBC_1991_03_06	2	5.696	19.237	22.974	3.737	0.612
EHM	SEBC_1991_03_06	3	17.044	28.67	32.676	4.006	0.612
EHM	SEBC_1991_03_06	4	46.277	49.72	53.048	3.328	0.597
EHM	SEBC_1991_03_06	5	7.526	99.325	101.718	2.393	0.567
EHM	SEBC_1991_03_06	6	10.865	109.244	111.074	1.830	0.536
EHM	SEBC_1991_03_06	7		121.939	124.028	2.089	0.536
EHM	SEBC_1991_03_08	1	7.459	1.654	3.809	2.155	0.541
EHM	SEBC_1991_03_08	2	7.314	11.268	15.011	3.743	0.556
EHM	SEBC_1991_03_08	3	4.854	22.325	24.631	2.306	0.526
EHM	SEBC_1991_03_08	4	7.071	29.485	32.236	2.751	0.536
EHM	SEBC_1991_03_08	5	14.612	39.307	42.493	3.186	0.557
EHM	SEBC_1991_03_08	6	5.524	57.105	60.125	3.020	0.547
EHM	SEBC_1991_03_08	7	5.448	65.649	68.122	2.473	0.531
EHM	SEBC_1991_03_08	8	17.049	73.57	76.444	2.874	0.531
EHM	SEBC_1991_03_08	9	4.693	93.493	95.821	2.328	0.531
EHM	SEBC_1991_03_08	10	5.738	100.514	103.621	3.107	0.541
EHM	SEBC_1991_03_08	11	28.020	109.359	111.719	2.360	0.567
EHM	SEBC_1991_03_08	12	5.289	139.739	142.75	3.011	0.526
EHM	SEBC_1991_03_08	13		148.039	151.137	3.098	0.546
EHM	SEBC_1991_03_09	1	5.796	1.148	4.439	3.291	0.546
EHM	SEBC_1991_03_09	2	7.401	10.235	14.241	4.006	0.572
EHM	SEBC_1991_03_09	3	4.856	21.642	25.02	3.378	0.516
EHM	SEBC_1991_03_09	4	6.460	29.876	33.067	3.191	0.536
EHM	SEBC_1991_03_09	5		39.527	44.292	4.765	0.572

EHM	SEBC_1991_03_10	1	6.426	2.165	4.122	1.957	0.546
EHM	SEBC_1991_03_10	2	5.390	10.548	13.633	3.085	0.567
EHM	SEBC_1991_03_10	3	7.273	19.023	22.892	3.869	0.541
EHM	SEBC_1991_03_10	4	22.627	30.165	33.352	3.187	0.541
EHM	SEBC_1991_03_10	5	11.072	55.979	59.944	3.965	0.561
EHM	SEBC_1991_03_10	6		71.016	73.601	2.585	0.536
EHM	SEBC_1991_03_11	1		42.003	45.688	3.685	0.643
EHM	SEBC_1991_03_12	1	17.450	1.892	3.697	1.805	0.567
EHM	SEBC_1991_03_12	2	7.570	21.147	22.67	1.523	0.552
EHM	SEBC_1991_03_12	3	16.098	30.24	32.228	1.988	0.551
EHM	SEBC_1991_03_12	4	5.881	48.326	50.758	2.432	0.551
EHM	SEBC_1991_03_12	5	5.829	56.639	59.28	2.641	0.536
EHM	SEBC_1991_03_12	6	5.131	65.109	68.119	3.010	0.547
EHM	SEBC_1991_03_12	7	5.806	73.25	76.758	3.508	0.552
EHM	SEBC_1991_03_12	8	6.632	82.564	85.558	2.994	0.562
EHM	SEBC_1991_03_12	9	4.640	92.19	94.422	2.232	0.531
EHM	SEBC_1991_03_12	10	2.858	99.062	101.607	2.545	0.526
EHM	SEBC_1991_03_12	11	6.090	104.465	108.069	3.604	0.551
EHM	SEBC_1991_03_12	12	6.522	114.159	116.952	2.793	0.561
EHM	SEBC_1991_03_12	13	13.594	123.474	126.412	2.938	0.572
EHM	SEBC_1991_03_12	14	5.517	140.006	142.39	2.384	0.541
EHM	SEBC_1991_03_12	15	11.515	147.907	152.362	4.455	0.551
EHM	SEBC_1991_03_12	16	2.887	163.877	167.128	3.251	0.547
EHM	SEBC_1991_03_12	17	6.181	170.015	174.229	4.214	0.571
EHM	SEBC_1991_03_12	18		180.41	184.248	3.838	0.586
EHM	SEBC_1991_04_01	1	28.915	10.638	12.605	1.967	0.511
EHM	SEBC_1991_04_01	2	11.884	41.52	43.821	2.301	0.506
EHM	SEBC_1991_04_01	3	13.646	55.705	58.674	2.969	0.505
EHM	SEBC_1991_04_01	4	59.102	72.32	75.602	3.282	0.500
EHM	SEBC_1991_04_01	5		134.704	137.896	3.192	0.501

EHM	SEBC_1991_04_02	1	8.093	4.739	6.97	2.231	0.496
EHM	SEBC_1991_04_02	2	64.605	15.063	18.907	3.844	0.516
EHM	SEBC_1991_04_02	3	24.300	83.512	87.29	3.778	0.511
EHM	SEBC_1991_04_02	4	17.675	111.59	114.371	2.781	0.531
EHM	SEBC_1991_04_02	5	18.337	132.046	135.01	2.964	0.536
EHM	SEBC_1991_04_02	6	22.255	153.347	156.27	2.923	0.496
EHM	SEBC_1991_04_02	7		178.525	182.177	3.652	0.511
EHM	SEBC_1991_04_03	1	7.768	1.806	5.457	3.651	0.511
EHM	SEBC_1991_04_03	2	1.633	13.225	16.326	3.101	0.526
EHM	SEBC_1991_04_03	3	8.090	17.959	20.493	2.534	0.486
EHM	SEBC_1991_04_03	4	8.615	28.583	31.349	2.766	0.501
EHM	SEBC_1991_04_03	5	2.197	39.964	42.225	2.261	0.501
EHM	SEBC_1991_04_03	6	23.573	44.422	46.845	2.423	0.511
EHM	SEBC_1991_04_03	7	17.308	70.418	71.991	1.573	0.496
EHM	SEBC_1991_04_03	8	6.943	89.299	92.576	3.277	0.516
EHM	SEBC_1991_04_03	9	7.753	99.519	102.589	3.070	0.511
EHM	SEBC_1991_04_03	10		110.342	113.342	3.000	0.496
EHM	SEBC_1991_04_04	1	6.267	2.716	4.865	2.149	0.485
EHM	SEBC_1991_04_04	2	7.237	11.132	14.425	3.293	0.526
EHM	SEBC_1991_04_04	3	7.024	21.662	24.458	2.796	0.485
EHM	SEBC_1991_04_04	4	13.314	31.482	34.324	2.842	0.531
EHM	SEBC_1991_04_04	5	7.658	47.638	50.48	2.842	0.511
EHM	SEBC_1991_04_04	6	5.618	58.138	61.83	3.692	0.496
EHM	SEBC_1991_04_04	7	7.258	67.448	70.154	2.706	0.486
EHM	SEBC_1991_04_04	8	67.900	77.412	81.61	4.198	0.531
EHM	SEBC_1991_04_04	9	6.746	149.51	152.246	2.736	0.490
EHM	SEBC_1991_04_04	10	14.198	158.992	161.557	2.565	0.491
EHM	SEBC_1991_04_04	11	3.780	175.755	178.719	2.964	0.490
EHM	SEBC_1991_04_04	12		182.499	186.242	3.743	0.521
EHM	SEBC_1991_04_05	1	7.262	1.366	5.068	3.702	0.516

EHM	SEBC_1991_04_05	2	11.607	12.33	15.466	3.136	0.486
EHM	SEBC_1991_04_05	3	6.183	27.073	30.472	3.399	0.511
EHM	SEBC_1991_04_05	4	6.110	36.655	39.012	2.357	0.485
EHM	SEBC_1991_04_05	5	6.256	45.122	48.612	3.490	0.511
EHM	SEBC_1991_04_05	6	6.787	54.868	57.159	2.291	0.511
EHM	SEBC_1991_04_05	7		63.946	66.182	2.236	0.485
EHM	SEBC_1991_04_06	1	6.852	32.267	35.56	3.293	0.491
EHM	SEBC_1991_04_06	2	15.807	42.412	45.463	3.051	0.502
EHM	SEBC_1991_04_06	3		61.27	64.011	2.741	0.518
EHM	SEBC_1991_04_07	1	20.101	16.729	19.886	3.157	0.552
EHM	SEBC_1991_04_07	2	9.253	39.987	42.652	2.665	0.567
EHM	SEBC_1991_04_07	3	10.393	51.905	54.472	2.567	0.536
EHM	SEBC_1991_04_07	4	11.213	64.865	67.267	2.402	0.517
EHM	SEBC_1991_04_07	5	10.004	78.48	81.447	2.967	0.570
EHM	SEBC_1991_04_07	6	9.027	91.451	94.29	2.839	0.551
EHM	SEBC_1991_04_07	7	9.596	103.317	105.106	1.789	0.529
EHM	SEBC_1991_04_07	8	7.678	114.702	118.568	3.866	0.562
EHM	SEBC_1991_04_07	9	7.726	126.246	129.591	3.345	0.566
EHM	SEBC_1991_04_07	10	10.257	137.317	139.643	2.326	0.506
EHM	SEBC_1991_04_07	11	23.549	149.9	151.999	2.099	0.521
EHM	SEBC_1991_04_07	12	6.415	175.548	179.022	3.474	0.570
EHM	SEBC_1991_04_07	13		185.437	189.462	4.025	0.544
EHM	SEBC_1991_04_08	1	10.250	11.779	15.578	3.799	0.555
EHM	SEBC_1991_04_08	2	8.293	25.828	27.27	1.442	0.523
EHM	SEBC_1991_04_08	3	6.576	35.563	38.727	3.164	0.571
EHM	SEBC_1991_04_08	4	9.526	45.303	48.498	3.195	0.561
EHM	SEBC_1991_04_08	5	10.348	58.024	60.157	2.133	0.529
EHM	SEBC_1991_04_08	6	8.653	70.505	73.125	2.620	0.529
EHM	SEBC_1991_04_08	7	26.755	81.778	85.214	3.436	0.540
EHM	SEBC_1991_04_08	8	19.976	111.969	114.302	2.333	0.529

EHM	SEBC_1991_04_08	9	13.497	134.278	137.042	2.764	0.555
EHM	SEBC_1991_04_08	10	20.437	150.539	154.096	3.557	0.556
EHM	SEBC_1991_04_08	11		174.533	176.821	2.288	0.518
EHM	SEBC_1991_04_09	1	9.796	2.52	4.806	2.286	0.511
EHM	SEBC_1991_04_09	2	8.396	14.602	17.399	2.797	0.531
EHM	SEBC_1991_04_09	3	24.796	25.795	27.35	1.555	0.551
EHM	SEBC_1991_04_09	4		52.146	54.463	2.317	0.541
EHM	SEBC_1991_05_04	1	8.236	0	4.178	4.178	0.653
EHM	SEBC_1991_05_04	2	5.222	12.414	16.293	3.879	0.637
EHM	SEBC_1991_05_04	3		21.515	24.423	2.908	0.663
EHM	SEBC_1991_05_04	4	8.792	53.903	56.902	2.999	0.668
EHM	SEBC_1991_05_04	5		65.694	68.273	2.579	0.602
EHM	SEBC_1991_05_05	1	6.207	3.208	5.61	2.402	0.607
EHM	SEBC_1991_05_05	2	14.013	11.817	15.201	3.384	0.627
EHM	SEBC_1991_05_05	3	6.326	29.214	31.769	2.555	0.592
EHM	SEBC_1991_05_05	4	5.756	38.095	41.165	3.070	0.652
EHM	SEBC_1991_05_05	5	5.452	46.921	49.611	2.690	0.647
EHM	SEBC_1991_05_05	6	5.174	55.063	58.042	2.979	0.581
EHM	SEBC_1991_05_05	7	21.563	63.216	66.999	3.783	0.643
EHM	SEBC_1991_05_05	8	5.947	88.562	91.147	2.585	0.622
EHM	SEBC_1991_05_05	9	7.065	97.094	100.341	3.247	0.586
EHM	SEBC_1991_05_05	10	5.340	107.406	109.713	2.307	0.602
EHM	SEBC_1991_05_05	11		115.053	117.603	2.550	0.647
EHM	SEBC_1991_05_06	1	7.981	3.689	6.496	2.807	0.642
EHM	SEBC_1991_05_06	2	21.522	14.477	17.138	2.661	0.638
EHM	SEBC_1991_05_06	3	5.797	38.66	40.729	2.069	0.602
EHM	SEBC_1991_05_06	4	5.617	46.526	50.188	3.662	0.612
EHM	SEBC_1991_05_06	5	5.976	55.805	58.623	2.818	0.648
EHM	SEBC_1991_05_06	6	23.641	64.599	66.587	1.988	0.577
EHM	SEBC_1991_05_06	7		90.228	92.787	2.559	0.587

EHM	SEBC_1991_05_07	1	75.796	6.84	10.835	3.995	0.627
EHM	SEBC_1991_05_07	2	5.682	86.631	88.73	2.099	0.586
EHM	SEBC_1991_05_07	3	5.548	94.412	97.472	3.060	0.627
EHM	SEBC_1991_05_07	4	5.507	103.02	105.372	2.352	0.587
EHM	SEBC_1991_05_07	5		110.879	114.283	3.404	0.637
EHM	SEBC_1991_05_08	1	15.067	21.969	24.817	2.848	0.622
EHM	SEBC_1991_05_08	2		39.884	42.656	2.772	0.612
EHM	SEBC_1991_06_01	1	11.587	2.427	5.213	2.786	0.542
EHM	SEBC_1991_06_01	2		16.8	19.359	2.559	0.556
EHM	SEBC_1991_06_02	1	27.735	10.742	14.328	3.586	0.602
EHM	SEBC_1991_06_02	2	24.098	42.063	44.738	2.675	0.602
EHM	SEBC_1991_06_02	3	9.612	68.836	72.543	3.707	0.571
EHM	SEBC_1991_06_02	4		82.155	85.145	2.990	0.607
EHM	SEBC_1991_06_03	1	10.811	11.082	14.415	3.333	0.607
EHM	SEBC_1991_06_03	2		25.226	28.858	3.632	0.607
EHM	SEBC_1991_06_04	1	8.268	2.504	4.329	1.825	0.572
EHM	SEBC_1991_06_04	2	9.323	12.597	14.853	2.256	0.566
EHM	SEBC_1991_06_04	3	8.258	24.176	26.169	1.993	0.551
EHM	SEBC_1991_06_04	4	8.883	34.427	36.425	1.998	0.556
EHM	SEBC_1991_06_04	5	6.975	45.308	48.171	2.863	0.581
EHM	SEBC_1991_06_04	6		55.146	57.68	2.534	0.577
EHM	SEBC_1991_06_04	7		110.791	113.294	2.503	0.551
EHM	SEBC_1991_06_05	1	8.941	0.875	3.06	2.185	0.552
EHM	SEBC_1991_06_05	2		12.001	14.793	2.792	0.551
EHM	SEBC_1991_06_06	1	3.165	40.645	43.436	2.791	0.571
EHM	SEBC_1991_06_06	2	5.368	46.601	48.948	2.347	0.556
EHM	SEBC_1991_06_06	3	7.108	54.316	57.735	3.419	0.596
EHM	SEBC_1991_06_06	4	6.740	64.843	69.225	4.382	0.602
EHM	SEBC_1991_06_06	5	5.312	75.965	78.22	2.255	0.571
EHM	SEBC_1991_06_06	6	6.121	83.532	86.117	2.585	0.577

EHM	SEBC_1991_06_06	7	5.112	92.238	94.529	2.291	0.562
EHM	SEBC_1991_06_06	8		99.641	101.664	2.023	0.581
EHM	SEBC_1991_06_07	1	6.369	13.196	15.411	2.215	0.556
EHM	SEBC_1991_06_07	2		21.78	24.329	2.549	0.567
EHM	SEBC_1991_06_10	1	5.270	3.417	6.417	3.000	0.561
EHM	SEBC_1991_06_10	2	5.552	11.687	14.524	2.837	0.546
EHM	SEBC_1991_06_10	3	6.377	20.076	23.252	3.176	0.561
EHM	SEBC_1991_06_10	4	5.183	29.629	31.85	2.221	0.536
EHM	SEBC_1991_06_10	5	6.158	37.033	39.885	2.852	0.556
EHM	SEBC_1991_06_10	6	5.430	46.043	48.005	1.962	0.531
EHM	SEBC_1991_06_10	7	8.175	53.435	56.287	2.852	0.561
EHM	SEBC_1991_06_10	8	5.536	64.462	66.769	2.307	0.541
EHM	SEBC_1991_06_10	9	6.779	72.305	75.031	2.726	0.561
EHM	SEBC_1991_06_10	10	6.083	81.81	83.99	2.180	0.536
EHM	SEBC_1991_06_10	11	7.186	90.073	92.298	2.225	0.556
EHM	SEBC_1991_06_10	12	4.940	99.484	101.927	2.443	0.531
EHM	SEBC_1991_06_10	13	7.075	106.867	109.709	2.842	0.566
EHM	SEBC_1991_06_10	14		116.784	119.313	2.529	0.541
EHM	SEBC_1991_06_11	1	5.735	1.79	4.324	2.534	0.541
EHM	SEBC_1991_06_11	2	8.089	10.059	12.79	2.731	0.552
EHM	SEBC_1991_06_11	3	6.099	20.879	23.423	2.544	0.572
EHM	SEBC_1991_06_11	4	5.091	29.522	32.097	2.575	0.541
EHM	SEBC_1991_06_11	5	6.157	37.188	39.833	2.645	0.557
EHM	SEBC_1991_06_11	6	6.038	45.99	48.216	2.226	0.541
EHM	SEBC_1991_06_11	7	5.730	54.254	56.798	2.544	0.536
EHM	SEBC_1991_06_11	8	6.647	62.528	65.816	3.288	0.556
EHM	SEBC_1991_06_11	9	13.955	72.463	75.027	2.564	0.566
EHM	SEBC_1991_06_11	10	14.871	88.982	91.713	2.731	0.562
EHM	SEBC_1991_06_11	11		106.584	109.27	2.686	0.542
EHM	SEBC_1991_06_12	1	5.707	4.571	7.884	3.313	0.556

EHM	SEBC_1991_06_12	2	5.014	13.591	16.019	2.428	0.536
EHM	SEBC_1991_06_12	3	28.471	21.033	24.017	2.984	0.536
EHM	SEBC_1991_06_12	4	15.811	52.488	55.199	2.711	0.567
EHM	SEBC_1991_06_12	5		71.01	73.726	2.716	0.546
EHM	SEBC_1991_06_13	1	6.615	5.524	7.633	2.109	0.531
EHM	SEBC_1991_06_13	2	7.417	14.248	17.192	2.944	0.557
EHM	SEBC_1991_06_13	3	7.248	24.609	26.622	2.013	0.566
EHM	SEBC_1991_06_13	4	5.826	33.87	36.454	2.584	0.542
EHM	SEBC_1991_06_13	5	7.147	42.28	45.386	3.106	0.541
EHM	SEBC_1991_06_13	6	2.116	52.533	55.405	2.872	0.542
EHM	SEBC_1991_06_13	7	5.349	57.521	59.908	2.387	0.536
EHM	SEBC_1991_06_13	8	5.510	65.257	68.565	3.308	0.536
EHM	SEBC_1991_06_13	9		74.075	77.089	3.014	0.567
EHM	SEBC_1991_06_14	1	8.307	3.372	6.513	3.141	0.531
EHM	SEBC_1991_06_14	2		14.82	17.126	2.306	0.561
EHM	SEBC_1991_06_14	3	5.653	39.134	41.476	2.342	0.526
EHM	SEBC_1991_06_14	4	6.105	47.129	50.113	2.984	0.531
EHM	SEBC_1991_06_14	5	8.162	56.218	59.136	2.918	0.577
EHM	SEBC_1991_06_14	6	5.992	67.298	70.323	3.025	0.536
EHM	SEBC_1991_06_14	7		76.315	79.163	2.848	0.546
EHM	SEBC_1991_06_15	1	9.257	24.657	27.838	3.181	0.546
EHM	SEBC_1991_06_15	2	6.692	37.095	39.082	1.987	0.526
EHM	SEBC_1991_06_15	3	4.796	45.774	48.262	2.488	0.541
EHM	SEBC_1991_06_15	4	4.745	53.058	55.748	2.690	0.526
EHM	SEBC_1991_06_15	5		60.493	63.23	2.737	0.531
EHM	SEBC_1991_06_15	6	7.075	81.973	84.73	2.757	0.531
EHM	SEBC_1991_06_15	7	6.370	91.805	94.829	3.024	0.556
EHM	SEBC_1991_06_15	8		101.199	104.269	3.070	0.547
EHM	SEBC_1991_06_16	1		14.88	17.814	2.934	0.557
EHM	SEBC_1991_11_02	1	29.464	11.019	13.81	2.791	0.521

EHM	SEBC_1991_11_02	2	5.800	43.274	45.823	2.549	0.536
EHM	SEBC_1991_11_02	3		51.623	54.122	2.499	0.510
EHM	SEBC_1991_11_03	1	6.426	4.202	6.194	1.992	0.541
EHM	SEBC_1991_11_03	2	6.832	12.62	16.029	3.409	0.541
EHM	SEBC_1991_11_03	3	6.717	22.861	25.658	2.797	0.546
EHM	SEBC_1991_11_03	4	23.416	32.375	34.737	2.362	0.556
EHM	SEBC_1991_11_03	5	27.278	58.153	61.501	3.348	0.562
EHM	SEBC_1991_11_03	6	17.831	88.779	91.88	3.101	0.552
EHM	SEBC_1991_11_03	7		109.711	112.422	2.711	0.556
EHM	SEBC_1991_11_04	1	11.010	1.087	3.788	2.701	0.561
EHM	SEBC_1991_11_04	2	14.471	14.798	17.949	3.151	0.562
EHM	SEBC_1991_11_04	3	7.550	32.42	35.631	3.211	0.531
EHM	SEBC_1991_11_04	4	5.621	43.181	46.277	3.096	0.551
EHM	SEBC_1991_11_04	5		51.898	54.765	2.867	0.531
EHM	SEBC_1991_11_04	6	7.329	87.126	89.695	2.569	0.541
EHM	SEBC_1991_11_04	7	5.813	97.024	99.877	2.853	0.526
EHM	SEBC_1991_11_04	8		105.69	108.31	2.620	0.571
EHM	SEBC_1991_11_05	1	5.654	9.821	12.188	2.367	0.536
EHM	SEBC_1991_11_05	2		17.842	20.295	2.453	0.520
EHM	SEBC_1991_11_05	3	14.383	65.241	68.144	2.903	0.536
EHM	SEBC_1991_11_05	4	18.335	82.527	84.732	2.205	0.556
EHM	SEBC_1991_11_05	5	7.503	103.067	105.631	2.564	0.547
EHM	SEBC_1991_11_05	6		113.134	115.825	2.691	0.526
EHM	SEBC_1991_11_06	1	37.499	1.755	4.901	3.146	0.516
EHM	SEBC_1991_11_06	2	33.614	42.4	45.171	2.771	0.521
EHM	SEBC_1991_11_06	3	6.241	78.785	81.966	3.181	0.561
EHM	SEBC_1991_11_06	4	6.922	88.207	90.999	2.792	0.577
EHM	SEBC_1991_11_06	5	5.269	97.921	100.617	2.696	0.546
EHM	SEBC_1991_11_06	6	5.811	105.886	109.755	3.869	0.556
EHM	SEBC_1991_11_06	7		115.566	118.641	3.075	0.531

EHM	SEBC_1991_10_05	1	8.953	1.775	4.577	2.802	0.612
EHM	SEBC_1991_10_05	2	7.806	13.53	16.777	3.247	0.617
EHM	SEBC_1991_10_05	3	8.236	24.583	26.981	2.398	0.607
EHM	SEBC_1991_10_05	4	8.099	35.217	37.493	2.276	0.607
EHM	SEBC_1991_10_05	5	7.788	45.592	49.315	3.723	0.607
EHM	SEBC_1991_10_05	6	9.156	57.103	60.137	3.034	0.622
EHM	SEBC_1991_10_05	7	10.707	69.293	72.707	3.414	0.612
EHM	SEBC_1991_10_05	8	9.026	83.414	86.236	2.822	0.607
EHM	SEBC_1991_10_05	9		95.262	98.883	3.621	0.612
EHM	SEBC_1991_10_06	1	8.849	2.109	5.392	3.283	0.622
EHM	SEBC_1991_10_06	2	8.032	14.241	17.336	3.095	0.612
EHM	SEBC_1991_10_06	3	6.981	25.368	29.859	4.491	0.627
EHM	SEBC_1991_10_06	4	9.635	36.84	40.365	3.525	0.607
EHM	SEBC_1991_10_06	5	6.650	50	53.778	3.778	0.632
EHM	SEBC_1991_10_06	6	7.941	60.428	63.801	3.373	0.612
EHM	SEBC_1991_10_06	7	7.858	71.742	76.122	4.380	0.633
EHM	SEBC_1991_10_06	8	10.103	83.98	87.409	3.429	0.617
EHM	SEBC_1991_10_06	9		97.512	100.263	2.751	0.618
EHM	SEBC_1991_10_07	1	9.929	8.733	12.446	3.713	0.607
EHM	SEBC_1991_10_07	2	8.755	22.375	25.693	3.318	0.617
EHM	SEBC_1991_10_07	3	9.062	34.448	37.721	3.273	0.622
EHM	SEBC_1991_10_07	4	9.366	46.783	49.995	3.212	0.617
EHM	SEBC_1991_10_07	5	8.851	59.361	63.844	4.483	0.647
EHM	SEBC_1991_10_07	6	7.817	72.695	75.957	3.262	0.617
EHM	SEBC_1991_10_07	7	8.623	83.774	87.112	3.338	0.612
EHM	SEBC_1991_10_07	8	6.796	95.735	99.701	3.966	0.622
EHM	SEBC_1991_10_07	9		106.497	110.119	3.622	0.622
EHM	SEBC_1991_10_08	1	8.174	3.882	7.746	3.864	0.632
EHM	SEBC_1991_10_08	2	11.396	15.92	19.446	3.526	0.622
EHM	SEBC_1991_10_08	3	7.975	30.842	34.302	3.460	0.602

EHM	SEBC_1991_10_08	4	9.413	42.277	45.979	3.702	0.612
EHM	SEBC_1991_10_08	5		55.392	58.948	3.556	0.627
EHM	SEBC_1991_10_09	1	8.030	3.838	7.353	3.515	0.612
EHM	SEBC_1991_10_09	2	11.771	15.383	18.995	3.612	0.622
EHM	SEBC_1991_10_09	3	9.765	30.766	34.008	3.242	0.617
EHM	SEBC_1991_10_09	4	9.538	43.773	47.536	3.763	0.632
EHM	SEBC_1991_10_09	5	14.554	57.074	60.66	3.586	0.561
EHM	SEBC_1991_10_09	6	7.089	75.214	77.814	2.600	0.556
EHM	SEBC_1991_10_09	7	5.737	84.903	87.71	2.807	0.511
EHM	SEBC_1991_10_09	8	7.786	93.447	97.326	3.879	0.551
EHM	SEBC_1991_10_09	9	5.606	105.112	108.051	2.939	0.536
EHM	SEBC_1991_10_09	10		113.657	116.752	3.095	0.526
EHM	SEBC_1991_10_10	1	6.960	1.573	4.562	2.989	0.516
EHM	SEBC_1991_10_10	2	3.294	11.522	14.825	3.303	0.505
EHM	SEBC_1991_10_10	3	0.249	18.119	21.174	3.055	0.602
EHM	SEBC_1991_10_10	4	8.932	21.423	25.651	4.228	0.551
EHM	SEBC_1991_10_10	5	3.345	34.583	38.189	3.606	0.576
EHM	SEBC_1991_10_10	6	5.223	41.534	45.221	3.687	0.617
EHM	SEBC_1991_10_10	7	4.795	50.444	53.029	2.585	0.602
EHM	SEBC_1991_10_10	8	11.972	57.824	59.999	2.175	0.618
EHM	SEBC_1991_10_10	9	4.152	71.971	74.571	2.600	0.597
EHM	SEBC_1991_10_10	10	5.179	78.723	81.702	2.979	0.607
EHM	SEBC_1991_10_10	11	5.179	86.881	89.112	2.231	0.607
EHM	SEBC_1991_10_10	12	5.645	94.291	96.744	2.453	0.597
EHM	SEBC_1991_10_10	13	4.448	102.389	104.959	2.570	0.597
EHM	SEBC_1991_10_10	14		109.407	111.536	2.129	0.602
EHM	SEBC_1991_10_11	1	0.314	10.75	13.901	3.151	0.612
EHM	SEBC_1991_10_11	2	1.892	14.215	16.456	2.241	0.521
EHM	SEBC_1991_10_11	3	11.615	18.348	21.205	2.857	0.612
EHM	SEBC_1991_10_11	4	6.656	32.82	35.87	3.050	0.547

EHM	SEBC_1991_10_11	5	5.195	42.526	45.222	2.696	0.592
EHM	SEBC_1991_10_11	6	4.220	50.417	53.518	3.101	0.592
EHM	SEBC_1991_10_11	7	11.708	57.738	60.733	2.995	0.612
EHM	SEBC_1991_10_11	8	1.233	72.441	74.819	2.378	0.602
EHM	SEBC_1991_10_11	9	18.960	76.052	78.829	2.777	0.546
EHM	SEBC_1991_10_11	10	7.065	97.789	100.354	2.565	0.602
EHM	SEBC_1991_10_11	11	5.342	107.419	110.181	2.762	0.602
EHM	SEBC_1991_10_11	12		115.523	118.275	2.752	0.602
EHM	SEBC_1991_10_13	1		3.759	6.965	3.206	0.587
EHM	SEBC_1991_10_14	1		2.281	5.23	2.949	0.591
EHM	SEBC_1991_10_15	1	6.357	13.271	17.398	4.127	0.551
EHM	SEBC_1991_10_15	2	9.589	23.755	26.815	3.060	0.536
EHM	SEBC_1991_10_15	3	6.094	36.404	39.333	2.929	0.536
EHM	SEBC_1991_10_15	4	8.163	45.427	48.553	3.126	0.536
EHM	SEBC_1991_10_15	5	6.953	56.716	60.04	3.324	0.510
EHM	SEBC_1991_10_15	6	7.702	66.993	71.577	4.584	0.537
EHM	SEBC_1991_10_15	7	6.702	79.279	82.169	2.890	0.515
EHM	SEBC_1991_10_15	8	8.506	88.871	93.034	4.163	0.552
EHM	SEBC_1991_10_15	9	7.135	101.54	104.721	3.181	0.526
EHM	SEBC_1991_10_15	10		111.856	114.551	2.695	0.490
EHM	SEBC_1991_09_02	1		3.323	5.28	1.957	0.496
EHM	SEBC_1991_09_05	1	29.914	7.168	9.14	1.972	0.587
EHM	SEBC_1991_09_05	2	11.879	39.054	41.37	2.316	0.586
EHM	SEBC_1991_09_05	3		53.249	55.975	2.726	0.592
EHM	SEBC_1991_09_06	1	21.575	4.979	6.703	1.724	0.642
EHM	SEBC_1991_09_06	2	7.226	28.278	29.664	1.386	0.532
EHM	SEBC_1991_09_06	3		36.89	38.651	1.761	0.556
EHM	SEBC_1991_09_07	1	20.912	4.036	5.457	1.421	0.541
EHM	SEBC_1991_09_07	2		26.369	29.419	3.050	0.531
EHM	SEBC_1991_08_01	1	6.567	41.277	44.216	2.939	0.562

EHM	SEBC_1991_08_01	2	6.181	50.783	54.111	3.328	0.562
EHM	SEBC_1991_08_01	3	0.534	57.669	59.758	2.089	0.552
EHM	SEBC_1991_08_01	4	1.312	60.292	64.09	3.798	0.556
EHM	SEBC_1991_08_01	5		65.402	67.446	2.044	0.566
EHM	SEBC_1991_08_02	1	26.044	0.475	3.889	3.414	0.571
EHM	SEBC_1991_08_02	2	6.107	29.933	32.32	2.387	0.531
EHM	SEBC_1991_08_02	3	16.114	38.427	41.968	3.541	0.566
EHM	SEBC_1991_08_02	4	5.382	58.082	61.834	3.752	0.551
EHM	SEBC_1991_08_02	5	5.593	67.216	70.837	3.621	0.541
EHM	SEBC_1991_08_02	6	5.858	76.43	80.204	3.774	0.571
EHM	SEBC_1991_08_02	7	6.710	86.062	89.638	3.576	0.582
EHM	SEBC_1991_08_02	8	6.613	96.348	100.424	4.076	0.567
EHM	SEBC_1991_08_02	9	6.371	107.037	110.386	3.349	0.587
EHM	SEBC_1991_08_02	10		116.757	119.888	3.131	0.576
EHM	SEBC_1991_08_03	1	2.036	2.372	6.044	3.672	0.572
EHM	SEBC_1991_08_03	2	6.995	8.08	11.985	3.905	0.587
EHM	SEBC_1991_08_03	3	6.519	18.98	22.242	3.262	0.582
EHM	SEBC_1991_08_03	4	6.603	28.761	31.826	3.065	0.557
EHM	SEBC_1991_08_03	5	5.646	38.429	42.081	3.652	0.551
EHM	SEBC_1991_08_03	6	7.936	47.727	51.455	3.728	0.556
EHM	SEBC_1991_08_03	7	18.526	59.391	61.758	2.367	0.571
EHM	SEBC_1991_08_03	8	6.869	80.284	83.728	3.444	0.562
EHM	SEBC_1991_08_03	9	6.996	90.597	93.92	3.323	0.551
EHM	SEBC_1991_08_03	10		100.916	104.492	3.576	0.572
EHM	SEBC_1991_08_04	1	5.883	3.857	6.856	2.999	0.576
EHM	SEBC_1991_08_04	2	5.792	12.739	16.588	3.849	0.562
EHM	SEBC_1991_08_04	3	16.497	22.38	27.776	5.396	0.597
EHM	SEBC_1991_08_04	4	7.757	44.273	47.803	3.530	0.581
EHM	SEBC_1991_08_04	5	5.897	55.56	58.341	2.781	0.541
EHM	SEBC_1991_08_04	6		64.238	68.198	3.960	0.567

EHM	SEBC_1991_08_05	1	3.136	27.209	30.112	2.903	0.622
EHM	SEBC_1991_08_05	2		33.248	37.203	3.955	0.637
EHM	SEBC_1991_08_06	1		76.677	79.099	2.422	0.546
EHM	SEBC_1991_08_07	1	63.701	2.19	4.598	2.408	0.556
EHM	SEBC_1991_08_07	2	8.722	68.299	69.958	1.659	0.572
EHM	SEBC_1991_08_07	3	8.766	78.68	80.349	1.669	0.566
EHM	SEBC_1991_08_07	4		89.115	90.774	1.659	0.566
EHM	SEBC_1991_08_08	1	19.193	2.413	5.022	2.609	0.536
EHM	SEBC_1991_08_08	2		24.215	26.329	2.114	0.531
EHM	SEBC_1991_07_01	1	15.546	29.627	31.696	2.069	0.511
EHM	SEBC_1991_07_01	2	14.131	47.242	49.3	2.058	0.501
EHM	SEBC_1991_07_01	3	36.713	63.431	66.036	2.605	0.516
EHM	SEBC_1991_07_01	4	4.318	102.749	104.545	1.796	0.526
EHM	SEBC_1991_07_01	5		108.863	112.064	3.201	0.567
EHM	SEBC_1991_07_02	1	6.838	7.877	10.27	2.393	0.541
EHM	SEBC_1991_07_02	2	8.807	17.108	19.753	2.645	0.556
EHM	SEBC_1991_07_02	3	8.892	28.56	30.462	1.902	0.526
EHM	SEBC_1991_07_02	4	8.073	39.354	42.273	2.919	0.546
EHM	SEBC_1991_07_02	5	5.067	50.346	52.824	2.478	0.531
EHM	SEBC_1991_07_02	6	7.721	57.891	60.49	2.599	0.556
EHM	SEBC_1991_07_02	7		68.211	69.981	1.770	0.526
EHM	SEBC_1991_07_03	1	6.291	8.087	9.929	1.842	0.521
EHM	SEBC_1991_07_03	2	16.598	16.22	19.154	2.934	0.557
EHM	SEBC_1991_07_03	3	14.427	35.752	39.02	3.268	0.546
EHM	SEBC_1991_07_03	4	17.218	53.447	56.254	2.807	0.541
EHM	SEBC_1991_07_03	5	8.014	73.472	75.783	2.311	0.561
EHM	SEBC_1991_07_03	6	9.357	83.797	86.458	2.661	0.526
EHM	SEBC_1991_07_03	7		95.815	97.935	2.120	0.546
EHM	SEBC_1991_07_05	1	61.964	1.838	3.636	1.798	0.536
EHM	SEBC_1991_07_05	2	7.384	65.6	67.551	1.951	0.551

EHM	SEBC_1991_07_05	3	15.732	74.935	76.693	1.758	0.561
EHM	SEBC_1991_07_05	4		92.425	94.432	2.007	0.587
EHM	SEBC_1991_07_06	1		25.932	28.122	2.190	0.552
EHM	SEBC_1991_07_07	1	41.380	9.118	10.691	1.573	0.556
EHM	SEBC_1991_07_07	2		52.071	54.398	2.327	0.572
EHM	SEBC_1991_07_08	1	5.910	1.533	4.496	2.963	0.556
EHM	SEBC_1991_07_08	2	7.857	10.406	13.249	2.843	0.562
EHM	SEBC_1991_07_08	3	4.586	21.106	24.05	2.944	0.526
EHM	SEBC_1991_07_08	4		28.636	32.05	3.414	0.521
EHM	SEBC_1991_07_09	1		3.51	6.393	2.883	0.597
EHM	SEBC_1991_07_10	1	3.203	1.902	4.744	2.842	0.572
EHM	SEBC_1991_07_10	2		7.947	11.022	3.075	0.566
EHM	SEBC_1991_07_11	1	6.026	2.769	4.303	1.534	0.511
EHM	SEBC_1991_07_11	2	15.509	10.329	13.131	2.802	0.546
EHM	SEBC_1991_07_11	3	26.396	28.64	31.265	2.625	0.547
EHM	SEBC_1991_07_11	4	6.906	57.661	59.472	1.811	0.511
EHM	SEBC_1991_07_11	5	21.292	66.378	68.978	2.600	0.516
EHM	SEBC_1991_07_11	6		90.27	92.329	2.059	0.516
EHM	SEBC_1991_07_12	1	7.375	2.301	4.694	2.393	0.506
EHM	SEBC_1991_07_12	2		12.069	13.567	1.498	0.531
EHM	SEBC_1991_07_13	1	6.552	4.008	7.104	3.096	0.576
EHM	SEBC_1991_07_13	2		13.656	15.917	2.261	0.597
EHM	SEBC_1991_07_14	1	5.386	2.473	5.725	3.252	0.572
EHM	SEBC_1991_07_14	2	-0.617	11.111	14.004	2.893	0.551
EHM	SEBC_1991_07_14	3	1.840	13.387	17.737	4.350	0.577
EHM	SEBC_1991_07_14	4	6.474	19.577	25.965	6.388	0.562
EHM	SEBC_1991_07_14	5	6.308	32.439	37.906	5.467	0.576
EHM	SEBC_1991_07_14	6	0.017	44.214	47.436	3.222	0.566
EHM	SEBC_1991_07_14	7	4.132	47.453	50.129	2.676	0.566
EHM	SEBC_1991_07_14	8	10.248	54.261	56.699	2.438	0.546

EHM	SEBC_1991_07_14	9	6.265	66.947	70.852	3.905	0.561
EHM	SEBC_1991_07_14	10	6.858	77.117	80.03	2.913	0.597
EHM	SEBC_1991_07_14	11		86.888	89.836	2.948	0.592
EHM	SEBC_1991_07_15	1	5.251	8.256	12.732	4.476	0.576
EHM	SEBC_1991_07_15	2		17.983	21.67	3.687	0.602
EHM	SEBC_1991_07_16	1	5.093	14.033	17.134	3.101	0.587
EHM	SEBC_1991_07_16	2	6.136	22.227	26.036	3.809	0.567
EHM	SEBC_1991_07_16	3	4.857	32.172	35.703	3.531	0.531
EHM	SEBC_1991_07_16	4		40.56	44.717	4.157	0.572
EHM	SEBC_1991_07_19	1	6.925	34.686	39.911	5.225	0.632
EHM	SEBC_1991_07_19	2	5.540	46.836	50.174	3.338	0.542
EHM	SEBC_1991_07_19	3	6.898	55.714	58.359	2.645	0.571
EHM	SEBC_1991_07_19	4	5.998	65.257	67.988	2.731	0.537
EHM	SEBC_1991_07_19	5	5.790	73.986	77.572	3.586	0.541
EHM	SEBC_1991_07_19	6	5.413	83.362	87.024	3.662	0.566
EHM	SEBC_1991_07_19	7		92.437	95.836	3.399	0.607

Appendix III: Sample Pitch Measurements of *Gallinago delicata* (Wilson's Snipe) Recordings in Praat

Table A3.1. Sample information and measurements from Praat for *Gallinago delicata* (Wilson's Snipe) drum recordings including collection name, tape reference number (REF_NO), drum number in the recording (DRUM_NO), time (PITCH_TIME) (s) and frequency (PITCH_FREQ) (Hz) of the 5th pulse from the end of the drum, the intensity values (INT_F0, INT_F1, INT_F3) (dB) of the first three harmonics (F0, F1, F2) (Hz) and the maximum frequency of the 2nd, 4th, 6th, 8th and 10th pulses from the end of the drum (2, 4, 6, 8, 10) (Hz).

COLLECTION	REF_NO	DRUM_NO	PITCH_TIME	PITCH_FREQ	F0	INT_F0	F1	INT_F1	F2	INT_F2	2	4	6	8	10
AVOCET	AV14588	1	1.852098	665.828525	793.77	37.60	1556.57	22.00	2435.35	18.30	795.46	776.23	761.47	749.72	732.02
			1.862098	763.085181											
			1.872098	789.746873											
			1.882098	794.437040											
			1.892098	796.583212											
			1.902098	793.214561											
			1.912098	776.373865											
			1.922098	727.295320											
			1.932098	656.213335											
AVOCET	AV14588	2										781.93		790.14	762.43
AVOCET	AV14588	3	2.515295	771.026060	769.16	28.70	1598.31	26.90	2327.92	23.10	804.12	795.06	803.08	781.50	764.30
			2.525295	782.952252											
			2.535295	794.138443											
			2.545295	790.739560											
			2.555295	792.922055											
			2.565295	789.392104											
			2.575295	779.413341											
			2.585295	730.531564											
AVOCET	AV14588	4	3.146349	809.434626	888.59	26.80	1712.76	11.00	2523.14	15.80	864.04	877.73	882.82	857.69	825.20
			3.156349	856.386539											

			3.166349	872.363682											
			3.176349	857.191378											
			3.186349	837.785366											
			3.196349	790.668973											
AVOCET	AV14588	5	1.720363	792.033874	826.48	28.80	1610.41	22.60	2427.03	24.00	804.13	810.24	813.31	772.97	750.41
			1.730363	805.740812											
			1.740363	802.260974											
			1.750363	801.944514											
			1.760363	783.698524											
			1.770363	734.103450											
AVOCET	AV14803	1	2.434250	744.081438	807.87	21.70					813.33	812.19	755.73		759.27
			2.444250	761.414519											
			2.454250	795.973721											
			2.464250	806.902138											
			2.474250	780.229780											
			2.484250	772.823426											
AVOCET	AV14803	2										817.25	813.59	805.50	790.63
AVOCET	AV14803	3									798.81	834.80	848.73	806.80	
AVOCET	AV14803	4	2.369073	635.168882	890.15	21.80	1776.12	15.30			842.34			893.03	899.21
			2.379073	768.483584											
			2.389073	835.822311											
			2.399073	874.659312											
			2.409073	891.839629											
			2.419073	892.673901											
			2.429073	821.570079											
AVOCET	AV14803	5	1.736250	806.208340	894.74	15.00	1738.37	26.40	2551.99	9.30	886.88	873.12	850.37	816.97	
			1.746250	842.719938											
			1.756250	859.824996											

			1.766250	868.467750											
			1.776250	850.386157											
			1.786250	817.051662											
AVOCET	AV14692	1	2.041615	798.424384	831.89	24.10					810.11	804.50	809.82	826.02	837.44
			2.051615	808.639657											
			2.061615	830.320443											
			2.071615	776.220170											
			2.081615	707.693692											
AVOCET	AV14692	2										730.71	780.11	749.20	737.31

Appendix IV: Vocal Tract Measurements for Three Species of Strigiformes

Table A4.1. Information for vocal tracts of three species of Strigiformes (*Bubo scandiacus*, *Bubo virginiaus* and *Strix varia*) including identification number (#), genus, species, sex and the following measurements: EC-culmen (mm), TA-tarsus (mm), flat wing (Flat_Wing) (mm), WT-body mass (WT-Bod_Mass) (mm), TL-body length (TL-Bod_Len) (mm), WS-wing extent (WS-Wing_Extent) (mm). The variables described in section 4.6 are also recorded (V1 (R), V1 (L), V2 (R), V2 (L), V3, V4 (R), V5, V6, V7).

#	Genus	Species	Sex	EC-Culmen	TA-Tarsus	Flat_Wing	WT-Bod_Mass	TL-Bod_Len	WS-Wing_Extent	V1 (R)	V1 (L)	V2 (R)	V2 (L)	V3	V4 (R)	V4 (L)	V5	V6	V7
1	*Bubo*	*scandiacus*	F	35.7	56	430	2459.5	600	1440	3.67	3.83	2.14	2.30	9.49	10.10	10.10	7.19	6.43	10.86
2	*Bubo*	*scandiacus*	F	29.3		442		571	144	3.06	3.21	1.22	1.84	10.10	8.87	8.26	7.04	5.36	9.64
3	*Bubo*	*scandiacus*	F							2.91	3.37	1.38	2.14	11.48	11.48	11.48	8.57	6.12	8.87
4	*Bubo*	*scandiacus*	M			420	1545			2.60	2.91	1.22	1.99	9.18	10.71	10.40	7.80	5.81	8.87
5	*Bubo*	*scandiacus*	F			460	1730			2.75	3.06	2.14	1.84	7.96	10.71	10.71	7.50	5.51	9.95
6	*Bubo*	*scandiacus*	M	33.6	58	399	879	520	1385	3.37	3.98	2.30	1.84	10.56	11.63	11.32	5.51	4.90	8.72
7	*Bubo*	*scandiacus*	M	34.4		426	937	533	1290	2.75	3.06	1.07	0.92	10.71	10.10	10.40	4.90	4.59	8.26
1	*Bubo*	*virginianus*	F							2.14	2.45			11.93	11.32	11.17	6.12	5.81	8.26
2	*Bubo*	*virginianus*	F	40	55.2	390	1098.9	555		2.75	2.91	1.38	1.53	11.63	10.40	10.56	5.05	5.20	8.11
3	*Bubo*	*virginianus*	F							2.75	2.30	1.22	1.38	15.30	10.40	11.63	5.81	6.43	8.87
4	*Bubo*	*virginianus*	F	46.5	65.2	370	1471.5	560	1290	3.06	2.30		1.22	10.71	11.48	10.71	4.90	6.12	9.03
5	*Bubo*	*virginianus*	F	41.1	65.8	360	1491.4	560	1340	2.75	2.75	1.53	1.68	13.31	11.02	10.71	6.12	5.36	8.26
6	*Bubo*	*virginianus*	F							2.91	3.21	1.68	1.38	12.85	12.09	12.39	5.36	5.81	9.18
7	*Bubo*	*virginianus*	F							3.21	3.52	1.53	1.53	13.77	11.48	11.17	5.97	4.90	8.57
8	*Bubo*	*virginianus*	F							2.60	3.06	1.84	1.53	11.32	11.32	10.71	5.36	5.05	8.87
9	*Bubo*	*virginianus*	F							2.91	2.75	1.53	1.84	13.77	11.32	10.71	5.66	5.20	7.65
10	*Bubo*	*virginianus*	F							2.91	2.91	1.53	1.38	13.16	11.63	12.09	5.20	5.81	7.65
11	*Bubo*	*virginianus*	F										1.99	16.07	10.40	10.25	4.44	3.98	8.72

12	*Bubo*	*virginianus*	F										1.07	12.85	10.71	10.40	5.36	4.90	8.26
13	*Bubo*	*virginianus*	M										1.07	11.93	10.71	10.71	5.20	5.36	8.42
14	*Bubo*	*virginianus*	M	41.8	64	360	1030.8	520					1.22	14.84	10.86	10.56	5.51	3.83	9.18
15	*Bubo*	*virginianus*	M										1.22	15.15	10.40	10.71	4.59	4.90	7.96
16	*Bubo*	*virginianus*	M										1.38	14.23	11.32	10.71	5.51	5.81	7.96
17	*Bubo*	*virginianus*	M							2.91	2.75	1.07	1.22	14.69	12.24	11.78		4.59	9.18
18	*Bubo*	*virginianus*	F	41.3	65.9	365	927.6	510	1080	2.91	2.91	1.38	1.68	13.16	10.10	9.64	4.44	4.59	8.87
19	*Bubo*	*virginianus*	M			380				2.75	3.06	1.38	1.38	16.37	13.01	12.85	5.20	5.81	9.18
20	*Bubo*	*virginianus*	M	32.6	74	376	1315	544		3.06	3.06	1.22	1.22	16.83	11.48	11.63	5.66	6.43	8.87
21	*Bubo*	*virginianus*	M	43.6		385	1120	540		2.91	3.06	1.22	1.53	16.22	10.86	10.71	5.81	5.05	10.10
22	*Bubo*	*virginianus*	M	43.5	64.4	390	1359	556		3.83	3.67	1.53	1.53	15.30	9.18	9.18	4.90	5.36	7.96
1	*Strix*	*varia*	F							1.22	2.30	2.14	1.84			9.64		4.28	7.19
2	*Strix*	*varia*	F	26.8	50.4	330	739.3	530	1280	1.84	2.30		1.22	8.72	5.81	5.51	3.67	3.83	5.97
3	*Strix*	*varia*	F							1.99	1.99	1.53	1.07	9.33	9.64	9.18	4.90	4.13	5.97
4	*Strix*	*varia*	F							1.84	2.30	1.53	1.53	11.02	9.03	8.57	3.83	3.06	6.58
5	*Strix*	*varia*	F							2.30	2.14	1.99	1.53	9.18	9.18	9.33	3.83	3.67	6.58
6	*Strix*	*varia*	F							1.99	2.75	1.53	1.38	10.71	9.33	9.03	4.74	3.37	6.43
7	*Strix*	*varia*	F	27	59.6	309	2054.4		1007	2.60	2.91	1.53	1.53	9.95	9.03	8.87	4.28	4.44	6.73
8	*Strix*	*varia*	F							1.68	1.84	1.22	1.22	10.10	8.42	8.72	4.90	3.98	6.27
9	*Strix*	*varia*	F	31.1	56	325	600.9	480	1000	3.06	3.06	1.22	1.07	10.71	8.42	8.26	6.12	3.83	6.73
10	*Strix*	*varia*	F	36	53.1	330	772.7	490	1030	1.84	1.84	1.68	1.38	11.02	9.03	8.87		3.21	6.89
11	*Strix*	*varia*	F							2.60	2.45	1.38	1.68	9.79	8.57	8.11	3.67	4.28	5.97
12	*Strix*	*varia*	F	34.3	52.7	335	821.5	485	1100	1.68	1.68	1.84	1.84	6.89	8.57	8.87	4.59	4.59	6.89
13	*Strix*	*varia*	M							2.45	1.99	1.99	1.84	11.32	9.03	9.33	4.74	4.90	7.04
14	*Strix*	*varia*	M							1.22	1.84	1.07	1.22	11.78	9.49	9.18	3.67	4.44	6.89
15	*Strix*	*varia*	M	37.4	57	320	423.1	440	970	1.53	2.14	1.07	1.07	8.87	9.95	9.64	3.67	4.13	6.89
16	*Strix*	*varia*	M	24.5	59.6	325	929.8	480	1123	2.30	2.30			10.71	8.11	9.18	5.97	3.83	7.04

17	*Strix*	*varia*	M							1.68	1.38	1.22	1.22	9.03	8.87	8.42	4.90	3.52	6.58
18	*Strix*	*varia*	M	31.7	56.8	320	639.5	480	1050	2.30	2.30	1.53	1.22	7.50	8.87	8.87	4.59	3.98	6.89
19	*Strix*	*varia*	F							2.30	1.99	1.53	1.99	8.26	9.49	8.72	5.81	3.52	6.43
20	*Strix*	*varia*	F	37.1	55.5	330	719.8	500	1040	2.30	2.45	1.84	1.53	9.18	9.95	9.79	5.97	3.37	6.89
21	*Strix*	*varia*	M							1.84	1.68			9.18	8.72	8.87	4.59	3.83	6.43

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