BEAUFORT REGIONAL
ENVIRONMENTAL ASSESSMENT

Birds of the Offshore
Canadian Beaufort Sea:
Database Manual

Canada

8 August, 2013

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by

Upun - LGL

LIMITED

for

Beaufort Regional Environmental Assessment
Northern Petroleum and Mineral Resources Branch
Aboriginal Affairs and Northern Development Canada
25 Eddy Street
Gatineau, Quebec

Project No. UA0009

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by

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INTRODUCTION

The database of the Birds of the Offshore Canadian Beaufort Sea is a compilation of data collected from surveys conducted by multiple companies and agencies. Surveys included in the database at present cover the period from 2002 to 2012. The purpose of this manual is to help the user interpret the data contained in the database, and to assist with the future incorporation of new data. The manual also summarizes the history behind the development of the database, as that relates to how the database is structured. For each field in the database, the purpose, content, formatting, measurement units (if applicable), and relationships to other fields (if any) are explained.

DEVELOPMENT OF THE DATABASE

The database is designed around a field protocol for pelagic seabird surveys that has been used offshore eastern Canada for several years — Eastern Canada Seabirds At Sea, or ECSAS. The current iteration of ECSAS is described in Gjerdrum et al. (2012). Some of the seabird surveys conducted in the Canadian Beaufort Sea, and included in the database, were conducted using this or very similar field protocols. ECSAS itself evolved from PIROP (Programme Intégré de Recherches sur les Oiseaux Pélagiques), which was conducted from the late 1960s through to the early 1990s. Gjerdrum et al. (2012) and Fifield et al. (2009) summarize the history of those survey protocols and the evolution of the ECSAS database.

The ECSAS database is a relational database that uses Microsoft Access. The design of the ECSAS database and the associated data entry system are customized to match the ECSAS ship-based field observation protocols, and to facilitate the organization, management, and analyses of the resulting data. This close association between field methodology and database design proved problematic for directly incorporating the variety of seabird survey data collected historically in the Canadian Beaufort. The existing data for the Canadian Beaufort include data collected using a variety of survey methods, and from aerial as well as ship-based survey platforms. Consequently, a separate course was taken for the Canadian Beaufort database.

The database of the Birds of the Offshore Canadian Beaufort Sea uses Microsoft Excel rather than Microsoft Access. To facilitate possible future incorporation into a revised ECSAS database, the overall organization of the Beaufort database and all of the fields were retained from ECSAS. New fields were added to incorporate additional types of information.

OVERVIEW OF DATABASE STRUCTURE

The structure of the database corresponds to the structure of the surveys — grouping data into cruise, watch, and sighting information categories. Cruise data include general information about the overall survey program, such as the name and type of survey platform, and cruise start and end dates. As most seabird surveys in the Beaufort have been conducted from ships, the term cruise is used even though some surveys have been conducted from aircraft. A "watch" in ECSAS terminology refers to a brief period of continuous observation — typically a 5- or 10-minute period for a survey from a moving ship, or a "snapshot" scan from a stationary survey platform (see Gjerdrum et al. 2012). Watch data include information about start and end times and locations, observers, the survey platform (e.g., speed, heading), and sea surface and weather conditions. Sightings data pertain to any birds seen during the watch (e.g., species identification,

number of individuals, and behaviour). The cruise, watch, and sighting categories, and the specific fields within each, are discussed in more detail below.

CRUISE DATA

There are eight fields of data in the cruise category. The name of each of those fields begins with "C_" to indicate that this is cruise-related information. The eight cruise data fields are preceded by the field "RecordID".

RecordID

Format: Number; no decimal places.

The values in the RecordID field are used to identify uniquely each record (row) in the database. RecordID values were assigned in numerical sequence, beginning with "1", after first sorting the records into chronological order by "C_CruiseID" (see below). That is, the data were organized first into unique cruises, then chronologically within each cruise. Future records can simply be added to the end of the existing database, without re-sorting chronologically and re-numbering.

All records must have a RecordID.

C_CruiseID

Format: Text; no spaces.
Example: C20100810BOSAtlantic

This field contains a unique identifier for each cruise. A cruise was defined as a period of time during which a series of observations were conducted from the same platform. As most offshore surveys of birds in the Canadian Beaufort Sea have been ship-based, a CruiseID refers to the period of time when the ship was in the Canadian Beaufort and observations were being conducted. For example, the seismic ship BOS Atlantic was surveying in the Canadian Beaufort from 10 August to 2 October 2010. That entire period of time was assigned one cruise identifier. The tug Alex Gordon was used to provide support to several seismic programs in the Canadian Beaufort for a few months each year, over several years. A different cruise identifier was assigned for each year. A CruiseID for an aerial survey was defined as a single flight. For example, if a survey transect was flown once every two weeks, each of those flights was defined as a separate cruise and given a different CruiseID.

C_CruiseID values begin with "C" followed by the start date of the cruise formatted as YYYYMMDD, followed by the name of the survey platform. Therefore, C20100810BOSAtlantic means the cruise of the BOS Atlantic that began on the 10th of August 2010. All survey effort made from the BOS Atlantic during that cruise has that same CruiseID.

All records should have a CruiseID, and the CruiseID values should be the same for each individual cruise. The name of the survey platform included in the CruiseID must match the survey platform in the C_PlatformName field (see below).

C_Company

Format: Text
Example: GXT

    This field indicates the name of the company or group that was conducting the work offshore. In the Canadian Beaufort database this includes companies that conducted seismic surveys offshore such as GX Technology (GXT), Chevron, BP, and Imperial. Some non-industry groups also collected offshore bird data, including ArcticNet, the Canadian Wildlife Service, and Fisheries and Oceans Canada.

    There should be no blank cells in this field. Also, all values should be the same for the same CruiseID and Program.

C_Program

Format: Text
Example: GXT 2010 Offshore Seismic

    This field provides a name for the overall program that the cruise is associated with. In the database, many program names refer to offshore seismic exploration programs. Many of the seismic programs involved several ships — the seismic source vessel, supply ship, and possibly a guard or picket vessel as well, for example. Observers often were placed on some or occasionally all of those vessels. In the database, each ship has its own CruiseID but all are within the same program. Sorting on the C_Program field thus assembles all data associated with a particular program.

    Preferably, all records should have a Program name, and this name should be the same for all records within a CruiseID and all CruiseIDs associated with the same program. If an official program name was available it was used; otherwise an arbitrary but descriptive name was chosen.

C_PlatformName

Format: Text
Example: M/V BOS Atlantic

    This field provides the name of the survey platform. This usually is the name of a ship, but can be the name of a survey aircraft or drilling platform, for example.

    Every record must have a PlatformName. That name should be the same for each CruiseID, and the PlatformName should match the name portion of the CruiseID.

C_PlatformType

Format: Text
Example: Seismic source vessel

    The general type of survey platform is provided here. This could be the type of ship (e.g., tug or research vessel), or aircraft (e.g., Twin Otter).

There should be a PlatformType for every record, and the PlatformType must be the same within a CruiseID. Sometimes the same ship is used over several seasons on different programs. Unless the function of the ship varies from program to program, the PlatformType should remain the same across programs.

C_StartDateLocal
C_EndDateLocal

Format: Custom DD-MMM-YYYY
Example: 10-Aug-2010

The data in these two fields show the local start and end times of a cruise. In those cases where it was known, the dates represent the start and end of the program. In other cases, these are the date (local time) of the first observations, and the date (local time) of the final observations on that cruise. Having the data formatted to display the month as a name rather than a number is intentional and important. Mistakes become obvious when dates are displayed this way, and there were mistakes with dates in some of the original data (for example, the second day of the ninth month [2 September] mis-formatted to display as the ninth day of the second month [9 February] when no ships would be sailing in the Beaufort!).

All records should have cruise start and end dates. Those dates should be the same for every record with the same CruiseID. Different ships that are part of the same program may have different cruise start and cruise end dates.

C_CruiseNotes

Format: Text

General comments about the cruise, that were not covered in the above fields, are provided here.

WATCH DATA

The 37 fields of Watch data are grouped into eight categories: general, when and where, watch details, observer information, survey platform information, survey conditions, and watch notes. The name of each Watch field is preceded by "W_".

W_WatchID

Format: Text
Example: C20100810BOSAtlantic_W20100902122530

The values in the WatchID field provide a unique identifier for each watch. There can be multiple records with the same WatchID; for example, if there were multiple bird sightings during that watch. The WatchID begins with the CruiseID, followed by an underscore, capital W, then the date and time (local time zone) of the start of the watch formatted as YYYYMMDDHHMMSS. The WatchID example provided above identifies the watch from the BOS Atlantic that began at 12:25:30 on 2 September 2010.

The WatchID values in the Beaufort database were generated by a macro that put together the various components from other fields. All records must have a WatchID.

W_WatchType

Format: Text
Example: Moving

There are three types of watches — moving, stationary, and incidental sighting. Moving watches are those conducted from a moving platform. They are a strip transect of fixed width and time, with the length of the strip being the distance travelled during the set time period of the watch. In the Beaufort database, most moving surveys were those conducted from ships using a 300-m width strip and of 5- or 10-minute duration. A stationary survey is an "instantaneous" scan from a fixed point on a stationary platform (e.g., drilling platform). Typically these are scans of a semicircle (180 degrees) and radius of 300 m. There were no stationary watches in any of the original data sets. Moving and stationary watches are described in detail in Gjerdrum et al. (2012).

An incidental sighting watch is simply the record of a sighting that is not part of a formal survey (i.e., not part of a moving or stationary watch). However, all birds that landed on a ship, and all landbirds, were considered incidental sightings even if seen during a moving or stationary watch.   Records of incidental sighting are important for documenting bird occurrence in the Canadian Beaufort because birds are not widespread and abundant there. Consequently, there are no sightings during many moving and stationary watches, and there are few moving and stationary watches because they have not been a priority during most recent offshore work (marine mammals have been the priority).

Each moving watch must have start and end times (W_StartDateTimeLocal and W_EndDateTimeLocal), start and end positions (W_StartLat, W_StartLong, W_EndLat, and W_EndLong), and defined width (recorded in the field W_MoveWidth_km).

Each stationary watch should have a start date/time and position, the number of degrees covered in the scan (W_StatArc_deg), and a radius (W_StatRadius_km).

Moving and stationary watches need not have sightings. However, incidental sighting watches must have associated sightings.

W_TimeZone

Format: Text
Example: UTC-6

Dates and times in the database are local, not UTC. The local time zone relative to UTC time is provided in this field. The Canadian Beaufort Sea study area falls within one time zone. Most survey effort has been, and likely will be, conducted during daylight savings time. That is six hours behind UTC (UTC-6). During standard time it is UTC-7. Some cruises extended across the beginning or end of daylight savings time. In that case, both UTC-6 and UTC-7 appear in records with the same CruiseID.

W_StartDateTimeLocal
W_EndDateTimeLocal

Format: Custom, DD-MMM-YYYY HH:MM:SS
Example: 28-Aug-2010 13:44:20

Dates and times are in the local time zone, not UTC. Times use the 24-hour clock; thus 2 PM is 14:00 h. It is important that the month appear as an abbreviation of the month's name rather than as a number. That makes it more obvious when data entry mistakes occur, and there is no ambiguity about the sequence of values (e.g., day-month-year versus month-day-year). Although most watches start and end on the same day, the date is included here to accommodate watches that occur over midnight (when there is 24-hour daylight).

All records must have a W_StartDateTimeLocal (plus W_StartLat and W_StartLong). W_EndDateTimeLocal values are only for moving watches, not stationary or incidental sighting watches. Thus, there must be no blank cells in the W_StartDateTimeLocal field. The watch start and end dates and times must fall within the start and end dates of the associated cruise.

W_StartLat
W_StartLong
W_EndLat
W_EndLong

Format: decimal degrees
Examples: (latitude) 70.49643, (longitude) -134.41991

All positions in the database are presented as decimal degrees. Because every watch must have a starting position, no blank cells are allowed in the W_StartLat and W_StartLong fields. All moving watches must have an end position as well. Stationary watches and incidental sightings do not have end positions.

W_ObsOutIn

Format: Text
Examples: Outdoors, Indoors

The values in this field simply indicate whether the observer(s) was(were) inside the survey platform or outside while conducting the watch. Observers on ships often surveyed from inside the bridge. The location of the observer may influence the observer's ability to detect birds. This field applies to all watch types, but many datasets did not include this information.

The following three fields pertain to moving watches only.

W_MoveObsSide

Format: Text
Examples: Starboard

The values in this field apply to moving watches only, and indicate which side of the survey platform the watch was conducted from. This field should be blank for all stationary and

incidental sighting watches. The values in the database are those recorded in the original data. How those were recorded varied from program to program.

W_MoveSnapShot?

Format: Text
Examples: YES, NO

The values in this field apply only to moving watches from ships. They record whether the snapshot methodology was used to record flying birds. "Snapshots" are instantaneous counts of flying birds. During a ship-based moving watch, all birds on the water are recorded but flying birds are recorded only at set intervals (usually every 300 m) along the strip. See Gjerdrum et al. (2012) for more details.

W_MoveWidth_km

Format: Number, displayed to 3 decimal places
Example: 0.300
Units: km

The values here indicate the width of the survey strip and apply only to moving watches. All moving watches must have a value in this field; no blank cells are allowed. For ship-based moving watches, 300 m (0.3 km) is the typical width. The surveys conducted during the GXT cruises in 2007 and 2008 used a transect width of 500 m to either side of the ship, thus a transect width of 1.0 km. The values in this field are used in the calculation of survey effort (i.e., survey area in km^2).

Transect width should not be greater than visibility (W_Visibility_km). For example, if fog is limiting visibility to 100 m (0.100 km), then it is not possible to survey birds out to 300 m. Transect width could be changed to 100 m in that case though.

The following three fields are for stationary watches only.

W_StatArc_deg

Format: Number, no decimal places
Example: 180
Units: degrees

The values in this field indicate the number of degrees of the arc of coverage. The standard is a semicircle or 180 degrees. That may vary if there are obstructions to visibility that limit the arc that the observer can scan.

This field should contain values only if the W_WatchType is stationary.

W_StatRadius_km

Format: Number, displayed to 3 decimal places
Example: 0.300
Units: km

A stationary watch is the scan of an arc from a stationary point. This field indicates the radius of that arc — the distance out to which survey coverage extends — and is used to calculate survey effort (area surveyed in km^2). (Sightings beyond the radius of the arc are considered "off transect" and not considered in the calculation of densities.) The standard radius of the survey arc is 300 m, or 0.300 km.

This field should contain values only if the W_WatchType is stationary. The scan radius should not be greater than the limit of visibility (as recorded in the field W_Visibility_km). However, the radius of a scan can be reduced to match the limit of visibility.

W_StatDir

Format: Text
Examples: N, NE, E, SE, S, etc.

W_StatDir records the direction that the observer is facing when looking out to the centre of the arc. If the arc is 180 degrees, then the direction of the stationary watch is at the midpoint with 90 degrees to the left and 90 degrees to the right. This field applies only to stationary watches.

W_Observer1
W_Observer1Skill
W_Observer2
W_Observer2Skill

Format: Text

These fields present the name and general skill level of the observer(s). For most watches there is only one observer. However, it is important to show if there are two observers as that changes survey effort. The names of observers are as provided in the original data. There may be spelling mistakes; even records where the name of the same observer is spelled in several ways. There also are records with codes rather than names, such as Biologist 1 or KA3. It is best to use the actual name of the observer. That allows follow-up with the observer if details of the record are in question, or a judgement of the quality of the record if it is known that the observer has limited identification skills, for example.

Three general levels of bird identification skill were used: beginner, intermediate, and experienced. If the observer and/or skill level were not known, or not recorded in the original data (most cases), the skill level was "Unknown". (An observer's skill level was critical to the acceptance of identifications. See the notes under the Sighting field S_SpeciesIDOriginal, below.)

Observers' names and skill levels should be recorded for every record; however, many records in the original data source did not include names, and most did not record skill levels. Observers' names should be spelled correctly, and should have the same spelling in every record where they appear. There should be a skill level for each observer, even if it is "Unknown". The skill level should remain the same for all records of that cruise. An observer may improve with experience, and their skill level can be adjusted accordingly, but it is unlikely that someone would improve a full grade (beginner to intermediate, or intermediate to experience) during a cruise.

W_ObsEyeHt_m

Format: Number, displayed to 1 decimal place
Example: 12.4
Units: metres

      The values in this field are the height of the observer's eye level, in metres, above the sea surface. It thus includes the height of the deck above the water, plus the distance from the deck to the observer's eye. The height of the observer above the water is used to calibrate the angle of view from the observer out to the outer edge of the survey area (e.g., to the 300-m transect edge). The observer's height also influences the observer's ability to detect birds that are low to the water. If the observer is low to the water, then birds can be hidden from view behind waves. If the deck is very high above the water surface, then the birds are farther from the observer and perhaps more difficult to detect and/or identify. For aerial surveys, use the survey altitude of the aircraft in this field.
      Some original data sets did not include information on the observer's height above the waterline. This field is blank in those cases. When possible, this field should be completed for every record.

W_PlatformSpeed_knots

Format: Number, displayed to one decimal place
Example: 4.6
Units: knots

      This field is required only for moving watches, but is worth recording for incidental sightings as well. There were a few cases in the original data where speed was "0" (i.e., ship not moving). When there was a sighting and ship speed was "0", then the W_WatchType was changed to incidental sighting. Platform speed must be "0" for stationary watches. Some original records were deleted because the speed was suspiciously high. Platform speed and platform heading (W_PlatformDir) can be used to calculate transect length and end position where W_EndLat and W_EndLong are not available.

W_PlatformDir

Format: Text, or Number
Example: N, ,E, E etc or 175
Units: compass directions (i.e., N, NE, E etc) or degrees

      W_PlatformDir provides the heading of the moving survey platform — the direction in which the survey platform is moving. The values in this field are those as provided in the original data. Some of those data sets recorded heading as compass points; others recorded the heading in degrees.
      W_PlatformDir and W_PlatformSpeed_knots were used occasionally to determine W_EndLat and W_EndLong.

W_PlatformActivity

Format: Text
Example: All airguns

In this field, a brief description of the principal activity of the survey platform is provided. Many of the watches were conducted from seismic source ships and, in those cases, this field often describes the activity of the airgun array — whether the airguns were inactive, or all airguns were firing, for example. For ships that are not seismic source vessels, a common description of platform activity is "In transit".

W_Visibility_km

Format: Text and Number
Examples: Good (>5 km), 10
Units: km

This is the estimate of the greatest distance to which the observer can see an object, in kilometres. This distance is affected by precipitation, fog, and light levels. Watches should not be conducted if the visibility is less than the outer limit of the survey coverage (e.g., visibility of <300 m if the survey strip width is 300 m), unless it is noted that the survey area has been reduced.

Visibility is a critical factor in detecting birds; it should be recorded with every record. When checking data, sighting distances should not exceed the visibility. Visibility should match or exceed the transect width of Moving watches, or the radii of Stationary watches. Transect widths and survey radii can be reduced to match the limits of visibility of course, but that must be recorded so survey effort can be adjusted.

Moving watches during the GXT 2007 and 2008 seismic programs used a transect width of 500 m to either side of the ship's track. Therefore, although the transect width was 1000 m (i.e., 500 m to port + 500 m to starboard), the minimum acceptable visibility was 500 m, not 1000 m.

W_Glare

Format: Text
Examples: None, Light, Moderate, Severe

The W_Glare field is used to record an estimate of the degree of glare on the area that is being surveyed. Glare reduces the detectability of birds and should be avoided. (The observer should survey the side of the ship away from the glare.)

W_Weather

Format: Text
Example: Overcast

This field is a brief description of the overall weather conditions and includes information about cloud cover and precipitation and/or fog. It is a catch-all field that provides information about several weather variables. Gjerdrum et al. (2012) include a list of codes for general weather and glare conditions.

W_SeaState

Format: Number
Examples: 0, 1, 2, 3, 4
Units: Sea state codes

Sea state is denoted in a series of codes that correspond to descriptions of the appearance of the surface of the ocean; for example, a code of 0 means a sea surface that is mirror calm. These codes are standardized (see Gjerdrum et al. 2012).

The values in W_SeaState, W_WaveHt_m, W_WindSpeed_kts, and W_WindForce_Beaufort should agree with each other. For example, a calm sea state and high Beaufort wind force should not appear in the same record.

W_Swell_m

Format: Number
Example: 2

The swell is a measure of the height of the swell of the sea, from the bottom of the trough to the top of the crest, in metres. The swell is not the same as waves; the sea surface can be mirror calm but still show a swell (from a previous or distant storm, for example).

W_WaveHt_m

Format: Number
Example: 2

The values in this field indicate the height of the waves, in metres, during a watch.

The values in W_SeaState, W_WaveHt_m, W_WindSpeed_kts, and W_WindForce_Beaufort should agree with each other. For example, a calm sea state and high Beaufort wind force should not appear in the same record.

W_WindSpeed_kts

Format: Number, displayed to 1 decimal place
Example: 12.3
Units: knots

The speed of the wind in knots is recorded in this field. The value should be True wind speed, accounting for the speed and direction of the survey platform. It was not always clear in the original data whether the value was True wind speed.

The values in W_SeaState, W_WaveHt_m, W_WindSpeed_kts, and W_WindForce_Beaufort should agree with each other. For example, a calm sea state and high Beaufort wind force should not appear in the same record.

W_WindForce_Beaufort

Format: Number
Examples: 0, 1, 2, 3, 4, 5

This is another field that provides a measure of the wind speed and sea conditions, including the previous fields W_SeaState, W_WaveHt_m, and W_WindSpeed_kts. It is based on the Beaufort Scale in which a series of codes correspond to descriptions of the surface of the sea. Each Beaufort code (and corresponding sea surface conditions) match a range of wind speeds under which those sea surface conditions occur. Watches are not effective in high winds.

The values in W_SeaState, W_WaveHt_m, W_WindSpeed_kts, and W_WindForce_Beaufort should agree with each other. For example, a calm sea state and high Beaufort wind force should not appear in the same record.

W_WindDir

Format: Text
Examples: N, NE, E, SE etc
Units: compass points

The direction from which the wind is coming is recorded here. The values could be finer compass points such as NNE or WSW.

W_IceType

Format: Text
Examples: pancake

This field provides a brief description or name of the predominant ice type(s) within about 1 km of the survey platform. There should be a value in W_IceType if there is a value in W_IceConc, and vice versa, but that was not always the case in the original data sets.

W_IceConc

Format: Text, or Percentage
Examples: <10%

An estimate of the percentage of the sea surface within about 1 km of the survey platform that is covered in ice. There should be a value in W_IceType if there is a value in W_IceConc, and vice versa. In the original data, however, there are many records with ice concentration but no ice type.

W_WaterDepth_m

Format: Number
Examples: 90.2
Units: metres

Water depth is an important factor influencing the distribution of birds at sea. However, it was rarely recorded in the original data sets. Water depth is most easily measured during shipboard surveys from the displays on the bridge instruments. That water depth is at the location of the ship, which usually is not that of the bird(s). The data would have to be estimated from a separate source (e.g., bathymetric chart) during an aerial survey. Water depth is measured at the start of a moving watch (as water depth will vary over the course of the moving watch).

W_WatchNotes

Format: Text

This is a field for additional notes about the watch. It is blank in most of the records.

SIGHTINGS DATA

All the data regarding bird sightings are grouped here. This includes information about the identification of the bird (species, age, sex, and plumage), number observed, sighting distance, behaviour, and other parameters. All 24 Sightings field names begin with "S_".

S_SightingID

Format: Text
Example: C20100810BOSAtlantic_W20100902122530_S1

Each sighting has a unique identifier. A sighting may require several records to include all birds in a flock, as each different age, sex, and plumage combination requires a separate record. Each of those records is associated under the same SightingID. The values are a combination of the CruiseID and WatchID, followed by S1, S2, S3, etc.

If there are no sightings during a watch, then no SightingID is assigned and the field is left blank. There must be a SightingID for each sighting, and a sighting for each SightingID.

S_IndividualID

Format: Text
Example: C20100810BOSAtlantic-1

This field is used to identify specific individual birds. It allows for the identification of re-sightings. Thus, multiple records of an individual bird can be recognized as re-sightings rather than multiple individuals. Some birds, especially land birds, occasionally land and linger on ships for several days. They can be denoted as the same individual using this field. The values in S_IndividualID are formatted as the CruiseID followed by a hyphen then a number. For each cruise, the number begins with 1 and continues sequentially through the cruise (1, 2, 3, …).

IndividualIDs with the same value must have the same species, age, sex, and plumage identification and count.

S_DateTimeLocal

Format: Custom, DD-MMM-YYYY HH:MM:SS
Example: 25-Aug-2010 18:05:25

This field provides the specific dates and times (local time zone) of sightings, rather than watches. They are used only for sightings during moving watches. The dates and times of incidental sightings are provided in the field W_StartDateTimeLocal. Although the watch dates and times provide good information, there were enough records in the original data sets with the times of the actual sightings during a watch, that it was decided to include these data rather than discard the information.

S_Lat
S_Long

Format: decimal degrees
Examples: (latitude) 70.49643, (longitude) -134.41991

These two fields provide the specific locations of sightings during moving watches. These two fields, along with S_DateTimeLocal, apply only to records with sightings. The date, time, latitude and longitude must fall within the limits of the corresponding watch.

S_SpeciesIDOriginal
S_SpeciesIDFinal

Format: Text
Example: Glaucous Gull

The identification as recorded in the original data set is kept in the IDOriginal field. However, in many cases, the original identification is questionable or even confusing (e.g., small brown bird), and/or the spelling is obviously wrong. The final identification is the value used analyses, and the identification considered the most accurate. However, the original identification is provided as well for reference. In cases where the skill of the observer was unknown, or known to be poor, the original identification to species level was reduced to an identification at a higher taxonomic level. For example, an original identification of a Sabine's Gull might be given a final identification of "Gull".

Original identifications were judged based on the skill level of the observer(s), where known, the difficulty of identifying the particular species, and the other information associated with the sighting (e.g., date, count, behaviour). Observers with a Beginner skill level had most of their identifications simplified to a more general category (e.g., gull, loon, small landbird, or even bird). Inuvialuit beginner observers were assumed to be familiar with the common and game species, so their identifications of Glaucous Gull, Arctic Tern, Snow Goose, Snowy Owl, Sandhill Crane, Common Raven, eiders, jaegers, and some other species or groups were accepted. Virtually all identifications by experienced observers were accepted.

There must be a value in the SpeciesIDOriginal field for every value in SpeciesIDFinal, and vice versa. Species names in the SpeciesIDFinal field must follow the convention for English names in the latest Checklist of the American Ornithologists' Union.

S_Count

Format: Number

        S_Count is the total number of individuals observed pertaining to that record. A record may be only part of a SightingID, in which case the count refers only to the combination of species, age, sex, and plumage with that record. Subsequent records are used to provide the data on individuals of different age, sex, and plumage in a sighting or flock. For example, a sighting of a flock that included adult male and adult female Long-tailed Ducks plus adult female White-winged Scoters would include three records —one for adult male Long-tailed Ducks, one for adult female Long-tailed Ducks, and one for adult female White-winged Scoters. The count for each record would pertain only to that species/age/sex combination.

S_AgeIDOriginal
S_AgeIDFinal

Format: Text
Values: Adult, Immature, Juvenile, or Unknown

        The age category of the birds in each sighting record is placed in these fields. The original age identification is as recorded in the original data set; the final age identification was used for analyses. In some cases, it was obvious that the original age determination was wrong because it is not possible (or very unlikely) that even an experienced observer could determine the age of the bird(s). See the text above with S_SpeciesIDOriginal and S_SpeciesIDFinal for a discussion regarding how identifications were judged.
        There must be a value in the AgeIDOriginal field for every value in AgeIDFinal, and vice versa.

S_SexIDOriginal
S_SexIDFinal

Format: Text
Values: Male, Female, or Unknown

        S_SexIDOriginal records the sex identification as provided in the original data set. S_SexIDFinal records the gender identification after considering the skill of the observer and other factors (see the text above with S_SpeciesIDOriginal and S_SpeciesIDFinal for a discussion regarding how identifications were judged). Some records identified as male or female in the original data set, had to be changed to "Unknown" in the final identification because it would be extremely difficult to tell male and female birds apart. For example, it is highly unlikely that even a skilled observer could tell a male Glaucous Gull from a female under field conditions.
        There must be a value in the SexIDOriginal field for every value in SexIDFinal, and vice versa.

S_PlumageIDOriginal
S_PlumageIDFinal

Format: Text
Values: Breeding, Non-breeding, or Unknown

These two fields provide the plumage identifications from the original data set, and the final assigned identification. See the text above with S_SpeciesIDOriginal and S_SpeciesIDFinal for a discussion regarding how identifications were judged.

There must be a PlumageIDOriginal field for every PlumageIDFinal, and vice versa.

S_InTransect/Semicircle?

Format: Text
Values: Yes, No, Not recorded

The values in this field indicate whether the record is within the survey area and thus can be included in the determination of density (birds per area).

This field applies only to Moving and Stationary watches, and thus should be blank for every Incidental Sighting record. All sightings during Moving or Stationary watches should have a value in this field, even if the value is "Not recorded". The values here should be checked against the values in the sighting distance fields (S_Distance_m, S_DistanceClass, S_DistFirstObs_m, and S_DistClosest_m) to ensure that the sighting does indeed fall within the transect width (W_MoveWidth_km) or scan radius (W_StatRadius_km).

S_Distance_m

Format: Number

This is the estimated distance to the original sighting of the bird. This was not recorded in any of the original data sets and the field is blank.

S_DistanceClass

Format: Text
Values: A, B, C, D

Distance classes refer to defined ranges of distance between the observer and the bird(s). Sightings are placed into distance classes to facilitate distance sampling analyses. Distance categories, rather than actual distances, are used because it is difficult to estimate actual distances to birds in the field. The distance categories used in the ECSAS protocol are 0-50 m (A), 50-100 m (B), 100-200 m (C), 200-300 m (D), and >300 m (E) (Gjerdrum et al. 2012).

S_DistFirstObs_m
S_DistClosest_m

Format: Number
Units: metres

In some of the original data sets, the distance when the bird was first sighted was recorded.

S_FlyWater

Format: Text
Values: Fly, Fly/Water, Water, Ice, Ship, Ship/Fly, Land

In the ECSAS protocol (Gjerdrum et al. 2012), birds on the water (swimming/diving) are recorded differently than birds in flight. The additional values of ship and land provide options for other possibilities.

S_FlightDir

Format: Text
Examples: N, NNE, NE, ENE, E, etc. ND = no direction (erratic)
Units: compass points

The values here show the approximate direction of flight. This is used for extended flight, migration movements for example, and not short distance flight. Records with values in this field should also have "Fly" or a similar value (e.g., Swim/Fly) in the S_Fly/Water field.

S_Association

Format: Text
Example: Circling ship

This is where information regarding any apparent association with the survey platform or another ship (e.g., nearby fishing vessel) is recorded. Gjerdrum et al. (2012) provide a list of different associations that are used in the ECSAS protocol.

S_Behaviour

Format: Text
Examples: Feeding

The behaviour notes recorded here are those as recorded in the original data sets. Gjerdrum et al. (2012) provide a set of behaviours, with codes, that can be used in this field.

S_SightingNotes

Format: Text

Any additional notes regarding the sighting are written here.

COMMENTS

Reviewer'sComments

Format: Text

The final field is one for general comments regarding that record. It usually was used to comment about issues with the record, such as problem identifications.

LITERATURE CITED

Gjerdrum, C., D.A. Fifield and S.I. Wilhelm. 2012. Eastern Canada Seabirds At Sea (ECSAS) standardized protocol for pelagic seabird surveys from moving and stationary platforms. Canadian Wildlife Service Technical Report Series No. 515. Atlantic Region. vi + 37 pp.

Fifield, D.A., K.P. Lewis, C. Gjerdrum, G.J. Robertson and R. Wells. 2009. Offshore seabird monitoring program. Environmental Studies Research Funds report no. 183. St. John's. 68 pp.