

# **MIGRATION MONITORING PROTOCOL**

## **Inglewood Bird Observatory**

**A project of the Calgary Bird Banding Society**



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## 1.0 Background

This Migration Monitoring Protocol sets out the goals, objectives, and methods utilized during migration monitoring at Inglewood Bird Observatory in Calgary, AB, as conducted by the Calgary Bird Banding Society (CBBS). Fall migration monitoring has occurred at IBO since 1995, and data collection has been completely standardized since 1997 (fall) and 2002 (spring). Standardized data collection methods are critical to ensure uniform day-to-day operation and year-to-year consistency, thus providing reliable data to regional, national and international conservation managers and regulators. IBO is a member of the Canadian Migration Monitoring Network (CMMN), a cooperative initiative of member stations, Birds Canada and Environment and Climate Change Canada.

The original protocol was based on methods described in section 6.9 of Hagan *et al.* (1994) and informed by McCracken *et al.* (1993), Hussell and Ralph (1996) and Dunn and Hussell (2011).

### 1.1 Goals and objectives

CBBS conducts annual spring (01 May-06 June) and fall (28 July-06 October) monitoring of bird migration at the Inglewood Bird Sanctuary (IBS). Monitoring will be conducted each day within those periods, unless inclement weather or unavailability of a Bander-in-Charge (BIC) precludes operation.

## 2.0 Inglewood Bird Observatory (IBO)

### 2.1 Study area

IBO conducts migration monitoring in the Inglewood Bird Sanctuary (IBS), a 36-ha (89 ac) area of the Federal Migratory Bird Sanctuary (gazetted in 1929) along the Bow River within the city of Calgary, AB (Fig. 1). Since 1970 this core area of mostly natural habitat on the west side of the river has been owned and managed by the City of Calgary. IBS is roughly triangular in shape, bounded on two sides by the Bow River, and on the third side by a multi-use pathway. The reserve area (approximately 4 ha or 9 ac) where IBO operates is at the southern end of IBS, within which the general public is not allowed, which is separated from the main area by chain-link fencing.

### 2.2 Habitat description

The general habitat is mature riverine balsam poplar (*Populus balsamifera*) forest with a well-developed shrub understory along the banks of the Bow River (Appendix A). Shrubs include Saskatoon (*Amelanchier alnifolia*), wolf willow (*Elaeagnus commutata*), willow (*Salix sp.*), buffaloberry (*Shepherdia canadensis*), snowberry (*Symphoricarpos sp.*), catoneaster (*Catoneaster sp.*) (App. A). Because of its location on the banks of the Bow River, IBO is subject to fluctuating water levels due to upstream dam releases and, in rare circumstances, uncontrolled flooding (see Section 4.5 for details). While land ownership is secure, the two biggest impacts on habitat are severe weather events, and the impact of herbivores. Beaver (*Castor canadensis*) are periodically relocated from the sanctuary, and most mature trees are protected by wire mesh. A resident herd of mule deer (*Odocoileus hemionus*), feeds on understory forbs, grasses and shrubs.

In 2023 the City of Calgary made changes to water flow through the IBS. Flow was restored in an old river channel, which previously had water only during spring flooding, which removed access to three nets (14, 17, 18). A cement/rock causeway was built blocking the pond close to the paved pathway such that water no longer flows through the pond and back into the river except during spring floods.

In 2001, CBBS adopted the Monitoring Avian Productivity and Survival (MAPS) program's Habitat Structure Assessment (HSA) Protocol (Nott 1999), which requires monitoring at least every five years. The MAPS project at IBO utilizes seven of the 12 net lanes involved in migration monitoring. In 2015, an extra replicate (App. A) was obtained to quantify any change to understory conditions due to the catastrophic 2013 flood.

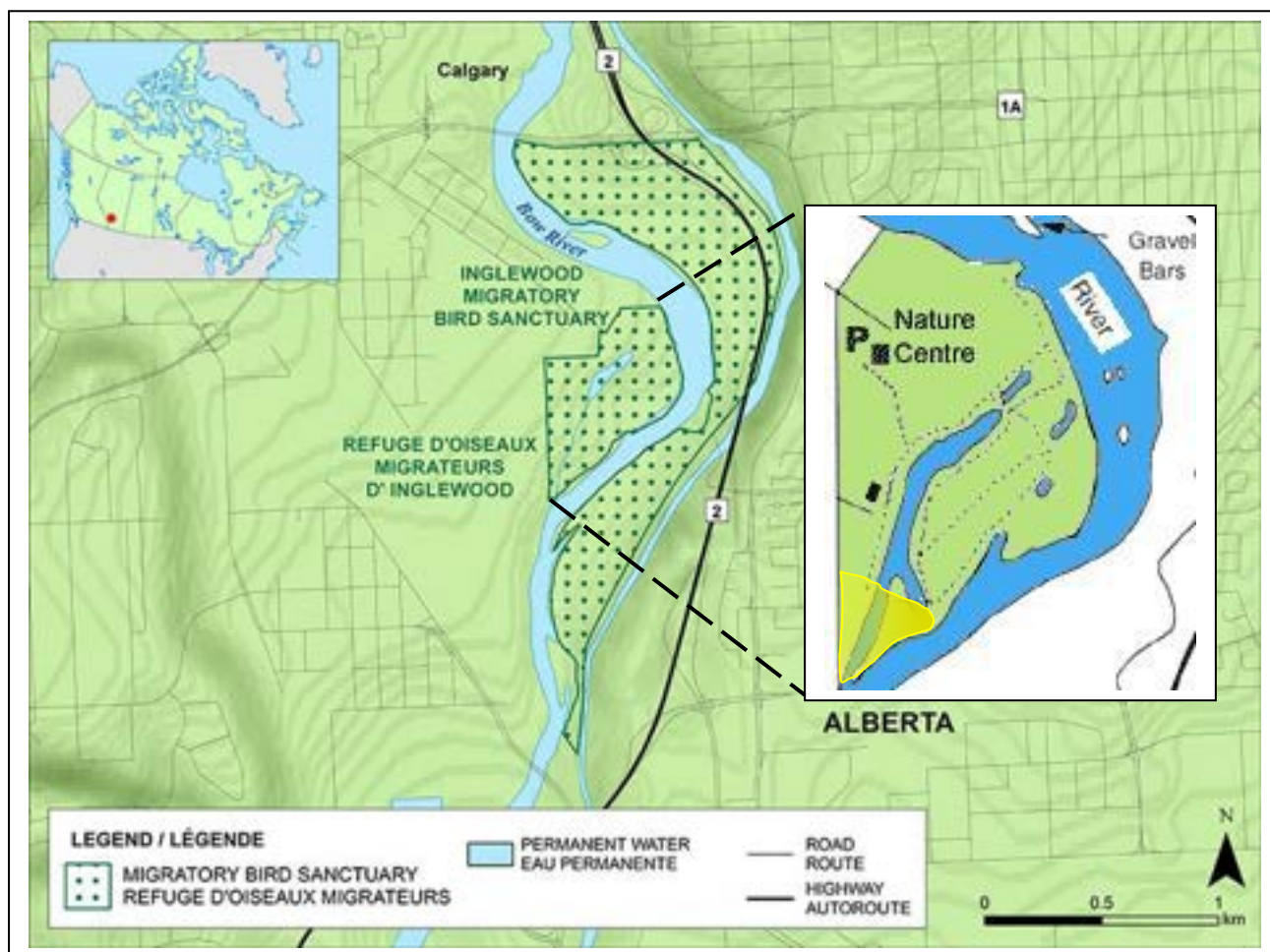


Figure 1. The Inglewood Federal Migratory Bird Sanctuary in Calgary, AB. Map available at: <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations/inglewood.html>. Inset map shows the core Inglewood Bird Sanctuary and the reserve area (yellow polygon) where the Inglewood Bird Observatory (IBO) operates.

Standardized photos of net lanes, and of the site more generally, convey a non-quantitative but very informative quick impression of site conditions and whether they have changed over time which might necessitate taking photos sooner. Photos will be taken every five years, starting in 2020, to coincide with the HSA schedule, or more often if important changes have occurred. Photos should be taken in the third week of both the spring and fall monitoring periods (01 May to June 06 and 28 July - 06 October, respectively). Photos are to be taken of every net lane and some general site conditions, as per the locations identified in Appendix B. Photos should be labeled and stored as set out in Appendix B.

### **3.0 Operation of the Observatory**

Deer are a constant threat to the nets and a problem for the banding effort. Approach all deer slowly and observe their behavior before determining how best to haze them away from the nets. Do not force deer to move into nets because you have cornered them.

#### **3.1 Mist net numbers and locations**

Twelve 12-m long x 2.6-m high x 30-mm mesh mist nets are operated in permanent net lanes for six hours each day, beginning at sunrise. The rebar for the net poles is permanent, and the geolocation of net lanes is given in Table 1. Nets should be operated for six hours from the standard opening time. However, early closure may be necessitated by any of the following conditions: adverse weather, damaged net, predator in the area, potential for capture of more birds than can be handled safely. Do not intentionally leave nets open longer than six hours from the standard opening time under any circumstances. We strive for year-to-year consistency. Checking for trapped birds should take place at least every 30 minutes. The order in which the nets are checked is not critical, although the usual sequence is: check 16, 19, 8 and 10 on the west side of the pond first then cross the causeway to check nets 15, 12, 13, 7, 5, 4, 3, and 1. Most of the nets are re-checked on the return trip as the trail goes right past them.

A Monitoring Avian Productivity and Survivorship (MAPS) station is run at IBO between 07 June and 08 August each year. The last MAPS day usually falls during FMM, during which nets are operated for both projects. Nets 1, 3, 4, 5, 7, 8, 10, and 15 are common to both projects, nets 2 and 6 are MAPS-only nets, and nets 12, 13, 16, and 19 are migration monitoring nets only (Fig. 2). During overlap days all nets are checked and birds processed as normal, but birds captured in the two MAPS-only nets are not included in the migration monitoring database.

Net lanes will be cleared completely prior to the start of the migration monitoring season. It is the BIC's responsibility to ensure that vegetation, especially directly under the nets, is clipped regularly during the season. If a tree falls across a net lane or impedes a path, or is otherwise a safety hazard, contact staff at IBS to have it cleared. All habitat modification must be discussed with staff at IBS.

#### **3.2 Mist net maintenance**

Only use nets in good condition. If other than minor repairs are required, replace with a new net as repairs affect catchability and increase potential for injury. Net poles should be placed perpendicular to the ground and parallel to one another at a distance of a net length plus 1-1/2 times the total shock cord length. Guy ropes are tied to an eyebolt at the top of the pole to prevent the tops of net poles from being pulled in. Guy ropes must not be used to provide tension. Do not slide net loops or shock cord up and down poles except when necessary to access an out-of-reach top loop. Sliding causes wear and eventual breakage. Do not tie knots in net loops to increase tension – re-locate poles or tighten shock cord instead. All nets must be properly furled, locked and raised above the height of deer at the end of each banding session. If the two nets located on the small island in the Bow River (12 and

13) are at risk of being flooded before the next day they should be taken down at the end of the banding session and put back up the next day (if water levels permit).

**Table 1.** Geolocation of the migration monitoring nets at IBO. Location given is of the net pole closest to the access route to that net lane. Angle of orientation (degrees) is from this pole along the direction of the net to the second pole. Geolocation precision is 2-5 m. Nets 14, 17 and 18 are no longer in use as of spring 2024.

Net #	Geolocation	Angle of orientation in degrees	Notes
1	N 51.02490, W -114.00950	350	Roughly perpendicular to reserve fence
3*	N 51.02489, W -114.00928	268	Perpendicular to net #4
4	N 51.02472, W -114.00936	353	To the north & contiguous with net 5
5	N 51.02454, W -114.00937	353	Pole closest to river; contiguous with net 4
7	N 51.02436, W -114.00969	358	Pole closest to trail
8	N 51.02411, W -114.01077	38	Between pond & road; roughly parallel to pond; first net of two
10	N 51.02420, W -114.01069	284	Between pond & road; perpendicular to pond; pole closest to pond
12	N 51.02406, W -114.00971	218	Perpendicular to #13 leading downstream
13	N 51.02417, W -114.00961	147	Parallel to bridge crossing channel
14	N 51.02441, W -114.00903	104	Perpendicular to river; pole closest to bank
15	N 51.02406, W -114.01012	268	Roughly perpendicular to pond
16**	N 51.02317, W -114.01099	210	Between gate and banding shed; pole closest to shed
17	N 51.02444, W -114.00902	11	Pole closest to #14
18	N 51.02454, W -114.00909	70	Pole closest to bank
19***	N 51.02374, W -114.01098	360	Between 8 & banding shed; pole closest to shed
Banding Shed	N 51.02951, W -114.01092		

\* Use for MAPS only until spring 2024 when it was added to the migration monitoring roster.

\*\* Net piloted in 1995 and not used again for migration monitoring until spring 2024.

\*\*\* New net added to migration monitoring in spring 2024.

Nets are constantly assessed by the BIC with assistance from volunteers. Nets are considered damaged if they contain small holes or tears allowing birds to pass through unabated. These should be repaired ASAP. Do not replace a damaged net with the intention of fixing it later... it will not happen! This action only results in an inventory of damaged nets in need of repair. If net requires significant repair it should be destroyed.

At the end of the season all nets must be stored dry in a breathable bag to prevent net rot. Stored nets should not be tied in the mesh area of the net. Toggle and shock cords may be left on for storage. Shock cord should be replaced when wear affects their function. Ensure that the trammel loops are bound with a plastic clip or another





Figure 2. Location of nets, by number and project, at IBO. Nets used for both migration monitoring and MAPS are shown in yellow; additional nets only used for migration monitoring are shown in blue (nets 14, 17 and 18 are no longer in use); and MAPS-only nets are shown in red. North is to the top of the map. Base map is from Google Earth, June 2024.

appropriate tie to prevent tangling. Secured trammel loops should hang outside of the bag. Ensure nets are dry before storing (all nets must be good and immediately usable the following season). Labelling nets with the net lane occupied is helpful.

All nets new and used are the property of CBBS and the responsibility of the BICs collectively. It is their responsibility to ensure that discarded nets are destroyed appropriately.

### 3.3 Other equipment

Is the responsibility of the BIC to keep tabs on the band supply and contact the Master Permit holder if more bands are needed, with sufficient lead time for delivery. Use bands in order if possible (i.e. lower sequences first).

**BICs must provide their own banding tools:** pliers suitable for the band sizes provided, band removal tools (e.g., circlips pliers), wing rules, electronic scale, and calipers. BICs must also provide their own field guides and ageing/sexing guides (Pyle 1997, 2008). Bird bags are provided to each BIC by CBBS and their care is the responsibility of the BIC. Clean bags must be in good supply at the beginning of the banding day. This means that soiled bags from the previous day must be washed in soapy water with bleach and available the next day. Birds should be weighed in their bags in a shallow container on the scale (subtract the bag weight=bird weight) rather than in weighing tubes. Ensure all numbers on clothespins are legible and that there are sufficient pins for the quantity of birds expected at each net.

Keep the banding table free of clutter. Unnecessary items (coffee cups, personal items, etc.) should not be present on the table while processing birds. Periodically wipe the table with bleach to disinfect. Regardless, this procedure should be done after every “big” run. Food and birds do not mix. Ensure that personnel wash their hands as well as disinfecting the table before eating.

Electronic scales become temperamental at about 5°C although a hand warmer placed beneath helps significantly. Wind may make weighing difficult as well – protect the scale from air movement by placing it inside the box at the station. If there is a backup spring scale available only use it when the electronic scale isn’t functioning properly; record its use in the comments.

BICs must ensure that all necessary supplies are available and in good working order at IBO including first aid kit, insect repellent (deet), sunscreen, latex gloves, and hand-held radios. Advise the next scheduled BIC of any shortage. Expenditures for routine items will be reimbursed by the CBBS treasurer upon submission of receipts. Higher cost items must be discussed with the CBBS Executive first.

### 3.4 Personnel requirements

Due to constraints imposed by The City of Calgary’s Area Manager, a maximum of four persons may participate within the restricted reserve area of the sanctuary at one time on any given day. This will include a Bander-in-Charge (BIC) and one to three volunteers. The BIC must be a qualified bird bander (a master permit or sub-permit issued by Environment and Climate Change Canada) holding mist-netting and any other appropriate authorizations. The BIC must have good identification skills and be able to use the age and sex keys contained in Pyle (1997, 2008), and conversant with data entry software, primarily Microsoft Excel. The BIC must exercise good judgment as to when mist nets should be closed due to weather or other circumstances that may endanger the birds. The BIC must be willing to train volunteers whenever possible. Occasionally there are no volunteers and the BIC can choose to work alone. CBBS has established a Working Alone Policy (Appendix C) in conjunction with IBS, which must be followed by the BIC.

All volunteers must be members in good standing of the Calgary Bird Banding Society. All members must review the annual CBBS and City of Calgary orientations. Within one year of joining, new members must attend the CBBS *Introduction to Bird Banding* session in order to volunteer during year 2 and future years.

### 3.5 Personnel safety

All participants must carry a CBBS hand-held FRS radio for communication within the group and are encouraged to carry a cell phone in case of emergency. Being within a secluded area within a major city, hazardous materials (e.g., needles) are occasionally encountered within the reserve area. Volunteers are instructed not to pick up any hazardous items, rather mark the location and call or stop in at the Nature Centre to report it, and a staff member will pick it up with a sharps or biohazard kit. If a homeless camp or combative person is encountered, volunteers should not engage but rather report same to the Nature Centre, call Bylaw Officers at 3-1-1 directly, or in extreme situations call 9-1-1. IBS provides a Safety Card for volunteers (see Appendix D for the 2019 card) on an annual basis, with updated phone numbers.

BICs are required to maintain valid Standard First Aid certification and CPR. First aid kits are available at the Banding Station and at the Colonel Walker House in the main sanctuary. BICs must report any serious (more than a band-aid) incidents to the CBBS executive, who will advise IBS.

The CBBS “Code of Ethics” (Appendix E) covers the safety and welfare of the birds as well as conduct of participants. All IBO participants are expected to treat each other with respect and courtesy at all times. Anyone who feels they have been harassed or treated unfairly is encouraged to file a confidential report to any executive member of the CBBS Board of Directors.

### 3.6 Reserve area rules

The Area Manager has placed the following requirements on field procedures. These restraints are intended to reduce human impact within the environmentally sensitive reserve portion of IBS where all bird banding will be performed.

- Only BICs will be issued a key to the 9<sup>th</sup> Avenue reserve gates. Both gates must be kept closed and locked at all times.
- Only one vehicle is allowed to park next to the pathway at the entrance to the reserve area (Fig. 3).
- A maximum of four persons will be in the reserve at any one time.
- Personnel must stay on the established pathways.
- Personnel must minimize their exposure to the general public while in the reserve and should wear low-visibility clothing.

## 4.0 **Data collection**

### 4.1 Data collected on captured birds

All birds captured, recaptured, repeating (same day), escapes or dead will be recorded on the data sheet (Appendix F). Opening and closing times (to the nearest 5 minutes) must be recorded on the net log.

All birds captured are identified to species, age, and sex. Except for hummingbirds, all unbanded birds are banded with a uniquely numbered USFWS aluminum leg band. The following data, in the order of the data sheet columns, are taken on all birds captured (only those marked with asterisk for same-day recaptures), using

standardized codes on the back of each data sheet (page 28):

- BIC at the top of each data sheet
- date at the top of each data sheet
- disposition,\*
- band size,\*
- band number,\*
- species (all birds must be identified to species before banding, unidentified species must be released),\*
- age (using calendar year),
- how aged using codes on reverse of data sheet,
- sex (using alpha code **Male** or **Female** or **Unknown**),
- how sexed using codes on reverse of data sheet (unless sex=U then left blank),
- wing chord (to nearest mm),
- body mass (to 0.1 g),\*
- extent of skull pneumaticization (only if skulled),
- presence (Y/N) of body moult,
- fat class using codes on reverse of data sheet,
- presence (Y/N) of cloacal protuberance (CP) or brood patch (BP) of adults,
- net run time and time bird banded (to nearest 5 minutes),\*
- net number,\*
- initials of scribe,\* and
- any pertinent notes (e.g., subspecies, primary moult, photos taken, feather sample taken, suspected age or sex, extra measurements, etc.).

All data will be collected unless there are more birds being captured than can be processed in a reasonable amount of time or other extenuating circumstances. An attempt to band all birds captured will be maintained although no individual bird will be held for more than one hour. Minimum data recorded will be species and obvious age and/or sex, even if bird is released at the net (unbanded birds are entered on data sheets and included in the daily totals for trend analyses).

The CBBS “Bird Safety Protocol” outlines principles to be followed that will reduce injury and/or mortality of birds, and identifies “red flag” or “sensitive” species that should be prioritised for extraction and/or processing (Appendix G). If a captured bird does not appear to be healthy, appropriate action and/or first aid should be taken to ensure the bird recovers, either on site or by taking it to a rehabilitation facility. The CBBS “Guide to first aid for birds injured during banding projects” (Appendix H) starts with a series of questions to ask to help ascertain the issue.

#### 4.2 Casual observations

Throughout the day, personnel will make note of any birds in the station area or near net lanes, apart from the ones captured in banding operations. The monitored area will include the entire reserve area. Birds seen or heard on or above adjacent lands and the Bow River will be included, as long as observed from within the boundaries. At the end of the shift the BIC will chair a review of the casual observations and record totals by species on the Daily Totals form (Appendix F). Casual observations are not part of IBO’s migration monitoring database but are reported to E-Bird.





Figure 3. Access and parking for the reserve area.

#### 4.3 Trend analysis

Trend analysis is based on IBO's banding captures only – new bandings, unbanded mortalities, captured but not banded, and foreign recaptures. IBO's contract statistician is provided with a complete data set and calculates his own daily totals for analysis.

#### 4.4 Record-keeping procedures

Clear and concise records must be kept for all activities performed during normal operation of the bird banding station at IBO. The following data forms (Appendix F) are to be filled out every day before leaving the field:

- *Daily Log* – includes the names of all participants present including Bander-in-Charge (BIC) and volunteer helpers. Space is provided for commentary on bird migration, bird injuries and mortalities, non-avian fauna and flora, and any management of the station that had to be performed. The summary of injuries and mortalities is particularly important – **do not leave blank** – enter “none” if that is the case. The daily log must be completed even if banding does not occur, indicating why migration monitoring did not happen.
- *Net Log* – this form contains columns for the opening and closing times for each net (recorded to the nearest five minutes), total amount of time each net is up, as well as space to record brief weather data at specific times during the day.
- *Daily Totals (DT)* – this form is the end result of each day's effort (maximum six hours) from all personnel involved at the migration monitoring station. It contains columns for each species of bird likely to occur during fall migration at IBS. Next to the species names are columns for numbers of newly banded birds (disposition 1), unbanded mortalities (disp. 0), captured but not banded (disp. 9), recaptures (disp. 2 and 3), and casual observations.
- *Banding Sheet* – contains space for all data taken from individual birds captured by mist net. The minimum data recorded on these sheets for banded birds must include disposition code, band number, species, age, sex, how aged and sexed, time banded, and net number. Secondary data, listed in order of importance, will also be collected whenever possible and appropriate – wing chord, skull ossification if skulled, mass, cloacal protuberance (CP), brood patch (BP), fat condition and moult. **An entry is necessary for each lost or destroyed band, new banding, recapture, captured but not banded, and mortality.** Try to identify subspecies whenever possible, time permitting – note the subspecies and your criteria in the notes column of the data sheet. Please note age and sex and how for all birds except same-day recaptures.

Data sheets are to be filed in the binder in the following order – Daily Log/Net Log, Daily Totals, data sheets for new bandings, data sheets for recaptures/mortalities/unbanded. **Do not staple them together.** Ensure that every sheet has the proper date on it. Record of the start and end number of all band strings used at IBO at the front of the data binder in order to facilitate identifying returning adults.

Ensure that your Excel data files include an entry for any lost or destroyed bands as well as new bandings, recaptures, escapes and mortalities. At the end of the season the master bander permit holder submits Estimated Daily Totals for trend analyses to the CMMN as well as banding records to the BBO.

#### 4.5 Record of changes or major interruptions to standardized data collection

If any standardized operational change or interruption occurs, enter details into Table 2 below, underneath any previous entries. Refer to parts of the text that were changed (e.g., section number, revised map, GPS points). Revise the 'latest version' date on page 1. If changes have been made to the protocol other than adding to the table below, submit a copy of the new protocol to Birds Canada along with year-end data submission; otherwise, send only a copy of the table.

Because of its location on the banks of the Bow River, IBO is subject to fluctuating water levels due to upstream dam releases and, in rare circumstances, uncontrolled flooding. These conditions typically arise during the first week of June during the annual freshet from the Rocky Mountains to the west, and sometimes in late August through first half of September, if heavy rain events occur. Two of the 12 net lanes are frequently inaccessible due to high water in late spring, although usually only for short periods of a few days to a week.

Table 2. Record of operational changes or interruptions to standardized data collection.

Date	Description of change and justification
1995	Fall migration monitoring initiated.
1997	Full complement of 12 net lanes standardized.
2002	Spring migration monitoring initiated.
2012	Spring migration monitoring had significantly reduced net hours on 9 days due to high water levels in the Bow River: May 01, 02, 03, 05, 10, 15, 24, 28; 06 June. Fall migration monitoring had significantly reduced net hours on 10 days due to high water levels in the Bow River: 28 Jul – 03 Aug; Sept 02, 11, 25; 02 Oct.
2013	Catastrophic flooding of the Bow River resulted in no access for fall monitoring.
2014	Spring monitoring did not start until 24 May due to ongoing safety concerns and clean-up efforts.
2014	Fall monitoring halted after September 12 <sup>th</sup> due to heavy snowfall damage to trees, resulting in loss of access.
2020	Spring monitoring had significantly reduced net hours for 14 days ( May 23-June 5) due to high water levels in the Bow River.
2024	Nets 14, 17, 18 are no longer accessible because restoration of water flow to the old channel flooded the net lanes. They were replaced with MAPS net #3, reactivated net #16 (piloted in 1995 then not used again for migration monitoring until spring 2024); and new net lane #19. Table 1, Figure 2 and Appendix B were updated.

#### 5.0 References

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- Pyle, P. 2008. Identification Guide to North American Birds - Part II *Anatidae* to *Alcidae*. Slate Creek Press, Point Reyes Station, CA. 836 pp.



## **Appendix A – Habitat Structure Assessment map and data forms**



IBO

The Institute for  
Bird Populations  
www.ibp.org

Location: INBS

Form H0: MAPS Station Map

Station: INBS

IBO

Date: (m/d/y) 10 / 06 / 2018

Zoot

Habitat types (>=5% cover of station)

A Balsam poplar - wolf willow -  
Saskatoon - middle terrace

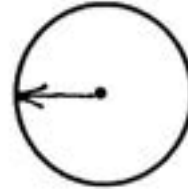
B Balsam poplar regenerating  
from caragana clearing - upper  
terrace

C Balsam poplar - Saskatoon -  
upper terrace

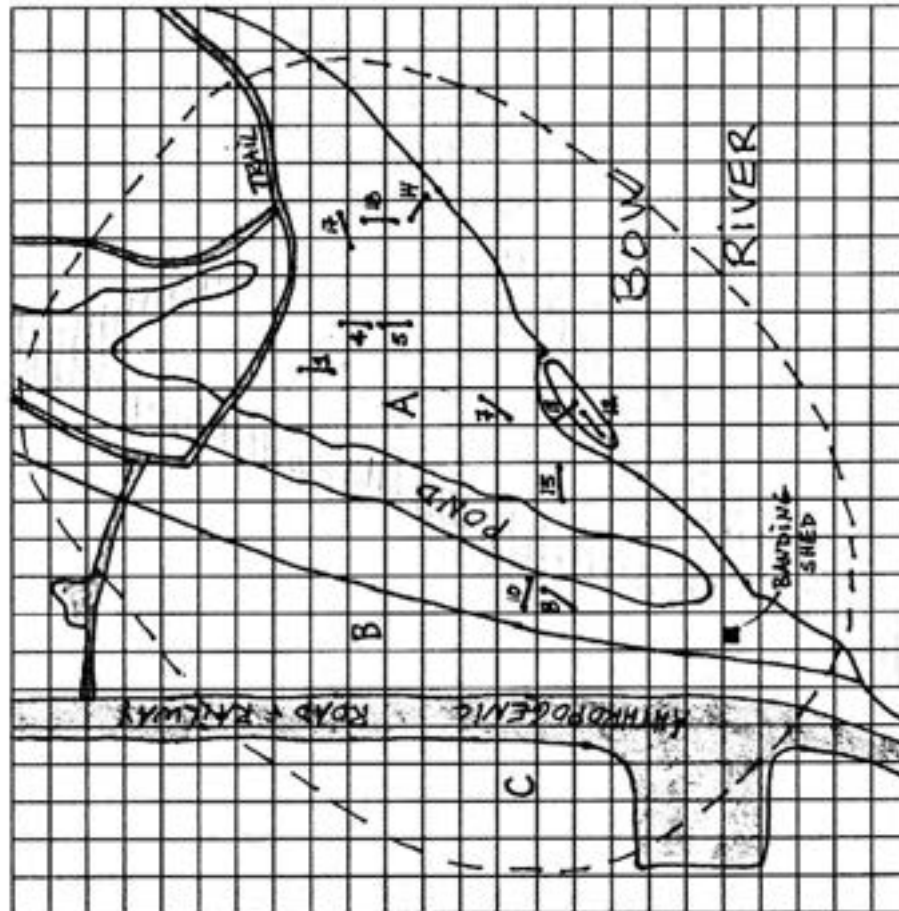
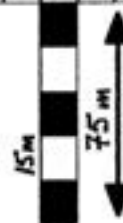
D \_\_\_\_\_

E \_\_\_\_\_

Indicate North with arrow



Indicate scale in meters  
(normally 30m per block)



\* nets shown are for migration monitoring



# Form H1: MAPS Habitat Structure Assessment (HSA) form

Location code: INBS Station code: INBS Date: (m/d/y) 07/21/2015 Surveyed by: GE Hornbeck, DMCollister Survey (circle one) single | consensus

Habitat dominance code (as shown on station map; circle one): A – dominant | B – sub-dominant | C – minor 1 | D – minor 2 | E – minor 3

Describe habitat type: Balsam poplar (Populus balsamifera)

Successional stage of habitat type (circle one): L – late | M – mid | E – early National Vegetation Classification Standard Formation: n/a

Percentage of station comprised of this habitat type (from station map): 60 % National Vegetation Classification Standard Alliance: n/a

Pattern code of this habitat type (1-12): 8 Average height of: Tree canopy 21 m, Shrubs 4.5 m, Herbaceous vegetation 0.8 m

Vegetative Layers	Cover <sup>1</sup> <5, 10, 20, see below, 50, >95	Pattern 1-12	Number of Species	Conifer	Estimated percentages must add up to 100% Vegetation types within each layer	Forbs & ferns	Grass-like	Main species e.g. <i>Vaccinium myrtillus</i> , <i>Poa pratensis</i> ( <i>Quercus rubra</i> , <i>Q. alba</i> , <i>Pinus contorta</i> )			
Upperstory: >15m	15	7	1		%	%	%	Balsam poplar			
Midstory: 5-15m	45	8	3		%	100	%	Saskatoon, Salix, Waterbirch			
Understory: 0.5-5m	60	8	6		%	100	%	Shepherdia, Dogwood, Cotonaster			
Ground cover*: <0.5m	50 %	9	6	Woody 40 %	Nonvascular 0 %	Forbs & ferns 40 %	Grass-like 20 %	Snowberry, Saskatoon, Wolf-willow			
Live vegetation	10 %	7	leaves	twigs	branches	old logs	stem	Smooth bromeliad, Yellow sweet-clover			
Dead vegetation	40 %	NA see text p.13	rock	stones or gravel	dirt or sand	water	percent treefall	Aspen, Canada thistle, Aloha clover, Wild yarrow			
Total non-vegetative											
Non-vegetative Features	Estimate %	Pattern 1-12	Circle one or more features of cover type								
Running water	%		seep/trickle	very small brook (<0.5m)	small stream (0.5-2.0m)	large stream (2.0-5.0m)	river (>5m)				
Standing water	%		pond/lake <50m <sup>2</sup>   >50m <sup>2</sup>	for livestock <50m <sup>2</sup>   >50m <sup>2</sup>	marsh/bog <50m <sup>2</sup>   >50m <sup>2</sup>	seasonal occasional	permanent other				
Human-made Corridors	%		paved	gravel	dirt	mown	boardwalk				
Human-made Structure	%		road	track	break	path	other				
			building	fence	bridge	powerline	tower				
			culvert	dam	channel	wall	other				
General description of habitat type including habitat age:											
Habitat located on first and second river terraces. Balsam poplar forest. Saturated and water birch											
Note: first terrace receives annual spring flooding; second terrace flooded 2005 and more severely 2013 with all deposition											
Note: We cannot explain why the upperstory canopy is measured so much taller than 2012 HSA											
Number of snags (>1m tall, >10cm diam.): 0   <5   <u>5-15</u>   >15											
Management / Disturbance history: No public access to BES Reserve section											
Update herbivory, mule deer are resident											
Logging: No clear-cut   selective   strip											
Disturbance: fire   wind   flood   drained   ice storm											
Other: see 2014 HSA snowfall caused tree damage											
Percentage cover midpoints	<5	10	20	30	40	50	60	70	80	90	>95
Percentage cover range	0-5	5-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100



# Form H1: MAPS Habitat Structure Assessment (HSA) form

Location code: INBS Station code: INBS Date: (m/d/y) 07/21/2015 Surveyed by: GE Hornbeck DM Collister Survey (circle one): single consensus  
Habitat dominance code (as shown on station map; circle one): A - dominant B - sub-dominant C - minor 1 | D - minor 2 | E - minor 3

Describe habitat type: Balsam poplar regeneration following clearing of caragana stand

Successional stage of habitat type (circle one): L - late M - mid E - early National Vegetation Classification Standard Formation: n/a

Percentage of station comprised of this habitat type (from station map): 15 % National Vegetation Classification Standard Alliance: n/a

Pattern code of this habitat type (1-12): 8 Average height of: Tree canopy 8 m, Shrubs 2.5 m, Herbaceous vegetation 0.8 m  
Note: appears we over-estimated tree canopy height in 2012

Vegetative Layers	Cover <5, 10, 20, see below, 90, >95	Pattern 1-12	Number of Species	Vegetation types within each layer Estimated percentages must add up to 100%				Main species e.g. <i>Vaccinium ovatum</i> , <i>Poa pratensis</i> <i>Quercus rubra</i> , <i>Q. alba</i> , <i>Pinus contorta</i>
				Conifer	Broad	Forbs & ferns	Grass-like	
Upperstory: >15m				%	%	%	%	
Midstory: 5-15m	40	8	1		100			
Understory: 0.5-5m	35	7	8		100			Balsam poplar
Ground cover*: <0.5m	100	1	7	Woody	Nonvascular	Forbs & ferns	Grass-like	Saskatoon, Wolf willow, Balsam poplar Caragana, Waterbush, Honeysuckle, Aspen, snowberry
Live vegetation	0			15	0	10	75	
Dead vegetation	0			twigs	branches	old logs		Smooth Brome, Veitch Canada thistle Goldenrod, Toadflax, Aster, Goat's beard
Total non-vegetative	0	NA, see text p.13	rock	stones or gravel	unvegetated	water	recent treefall	
Non-vegetative Features	Estimate %	Pattern 1-12	Circle one or more features of cover type					
Running water	%		seep/trickle	very small brook	small stream	large stream	river	
Standing water	%		canal	( <0.5m )	( 0.5-2.0m )	( 2.0-5.0m )	( >5m )	
Human-made Corridors	%		pond/lake	for livestock	marsh/bog	seasonal	permanent	
Human-made Structure	%		<50m <sup>2</sup>   >50m <sup>2</sup>	<50m <sup>2</sup>   >50m <sup>2</sup>	<50m <sup>2</sup>   >50m <sup>2</sup>	occasional	other	
			paved	gravel	dirt	mown	boardwalk	
			road	track	break	path	other	
			building	fence	bridge	powerline	tower	
			culvert	dam	channel	wall	other	
General description of habitat type including habitat age:								
Young Balsam Poplar forest on third terrace above Bow river. Note: the third terrace does not flood during 2013 and probably very infrequently (rest part of floodplain)								
Number of snags (>1m tall, >10cm diam.): 0   <5   5-15   >15								
Management / Disturbance history:								
Caragana removal by the City of Calgary 18 years ago								
Ssp. 2014 snowfall may have damaged trees, but the effects are not obvious in natural area								
Year(s) occurred: Year(s) occurred: 18 years ago Year(s) occurred:								
Logging: clear-cut   selective   strip								
Disturbance: fire   wind   flood   drained   reforest								
Other: cleared 18 yrs ago								
Percentage cover midpoints: <5   5   10   20   30   40   50   60   70   80   90   >95								
Percentage cover range: 0-5%   5-15%   15-25%   25-35%   35-45%   45-55%   55-65%   65-75%   75-85%   85-95%   95-100%								
* Ground Cover (Live vegetation, Dead vegetation, and Total non-vegetative) must total 100%								



# Form H1: MAPS Habitat Structure Assessment (HSA) form

Location code: INBS Station code: INBS Date: (m/d/y) 07/21/2015 Surveyed by: GE Hembeck, DM Collator Survey (circle one): single consensus  
Habitat dominance code (as shown on station map; circle one): A - dominant | B - sub-dominant | C - minor | D - minor 2 | E - minor 3

Describe habitat type: Balsam poplar / Saskatoon

Successional stage of habitat type (circle one): L - late | M - mid | E - early National Vegetation Classification Standard Formation: n/a

Percentage of station comprised of this habitat type (from station map): 25 % National Vegetation Classification Standard Alliance : n/a

Pattern code of this habitat type (1-12): 10 Average height of: Tree canopy 14 m, Shrubs 3 m, Herbaceous vegetation 0.7 m

Vegetative Layers	Cover <5, 10, 20, ... see below, 90, >95	Pattern 1-12	Number of Species	Vegetation types within each layer <i>Estimated percentages must add up to 100%</i>			Main species <i>e.g. Vaccinium oxycoccos, Poa pratensis</i> <i>Quercus rubra, Q. alba, Pinus contorta</i>																								
				Conifer	Broad Forbs & ferns	Grass-like																									
Upperstory: >15m				%	%	%																									
Midstory: 5-15m	70	10	1	%	100	%	Balsam poplar																								
Understory: 0.5-5m	80	10	6	%	100	%	Saskatoon, Coloniasier, Wolf-willow Salix, Buckbrush, Soapberry																								
Ground cover*: <0.5m	80	10	8	Woody 10	Nonvascular %	Forbs & ferns %	Grass-like %																								
Live vegetation	15	7	leaves	twigs	branches	old logs	recent treefall																								
Dead vegetation	0	NA see text p.13	rock	stones or gravel	dirt or sand	water	human-made																								
Total non-vegetative																															
Non-vegetative Features	Estimate %	Pattern 1-12	Circle one or more features of cover type				Comment																								
Running water	%		seep/trickle	very small brook ( <0.5m )	small stream ( 0.5-2.0m )	large stream ( 2.0-5.0m )	river ( >5m )																								
Standing water	%		pond/lake <50m <sup>2</sup>   >50m <sup>2</sup>	for livestock <50m <sup>2</sup>   >50m <sup>2</sup>	marsh/bog <50m <sup>2</sup>   >50m <sup>2</sup>	seasonal occasional	permanent other																								
Human-made Corridors	%		paved	gravel	dirt	mown	boardwalk																								
Human-made Structure	%		road	track	break	path	other																								
			building	fence	bridge	powerline	tower																								
			culvert	dam	channel	wall	other																								
General description of habitat type including habitat age: upland Mature Balsam poplar forest, some evidence that top died back in the past Note: Aspen and Poplar regeneration occurring																															
<table border="0"> <tr> <td>Number of snags (&gt;1m tall, &gt;10cm diam.):</td> <td>0</td> <td>&lt;5</td> <td>5-15</td> <td>&gt;15</td> </tr> <tr> <td>Management / Disturbance history:</td> <td colspan="4"></td> </tr> <tr> <td>No management that we are aware of, no history of flooding</td> <td colspan="4"></td> </tr> </table>								Number of snags (>1m tall, >10cm diam.):	0	<5	5-15	>15	Management / Disturbance history:					No management that we are aware of, no history of flooding													
Number of snags (>1m tall, >10cm diam.):	0	<5	5-15	>15																											
Management / Disturbance history:																															
No management that we are aware of, no history of flooding																															
<table border="0"> <tr> <td>Percentage cover midpoints</td> <td>&lt;5</td> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td>50</td> <td>60</td> <td>70</td> <td>80</td> <td>90</td> <td>&gt;95</td> </tr> <tr> <td>Percentage cover range</td> <td>0 - 5%</td> <td>5% - 15%</td> <td>15% - 25%</td> <td>25% - 35%</td> <td>35% - 45%</td> <td>45% - 55%</td> <td>55% - 65%</td> <td>65% - 75%</td> <td>75% - 85%</td> <td>85% - 95%</td> <td>95% - 100%</td> </tr> </table>								Percentage cover midpoints	<5	10	20	30	40	50	60	70	80	90	>95	Percentage cover range	0 - 5%	5% - 15%	15% - 25%	25% - 35%	35% - 45%	45% - 55%	55% - 65%	65% - 75%	75% - 85%	85% - 95%	95% - 100%
Percentage cover midpoints	<5	10	20	30	40	50	60	70	80	90	>95																				
Percentage cover range	0 - 5%	5% - 15%	15% - 25%	25% - 35%	35% - 45%	45% - 55%	55% - 65%	65% - 75%	75% - 85%	85% - 95%	95% - 100%																				

## Appendix B – Standardized habitat photography

- A complete set of photos will be taken every five years, starting in 2020, to coincide with the HSA schedule. If there are important changes to net lanes or the site in general, photos should be taken ahead of the normal schedule.
- Photos should be taken in the 3<sup>rd</sup> or 4<sup>th</sup> week of the spring (01 May to June 06) monitoring period.
- Photos should be taken at the standardized locations as per the table below.
- Carry this table of locations and a GPS. As GPS precision is only 4-5 m carry the 2020 photos to help find the proper location.
- Nets can be either furled or open.
- The nearest pole should be roughly in the centre for most of the photographs, with the bottom of that pole in the photograph. This should show the net lane as well as habitat to both sides and beyond the net.
- Net lane photos should be labelled as follows, based on the date the photo was taken: yyyy.mm.dd-net#-IBO (e.g., 20200526-net4-IBO). General site photos should be labelled with the name from the table below.
- If possible, turn on the date setting on your camera so that the date and time show on every photo. This is not critical, but provides a backup to the file name.
- Photos are to be submitted to the IBO manager for storage.

Net or site name	Geolocation (decimal degrees)	Where to stand & what to shoot description
1	N 51.02502, W -114.00948	Stand 5 m north of the northmost pole with back towards fence & shoot south
3	N 51.02489, W -114.01098	Stand with back towards river and shoot towards paved pathway.
4	N 51.02475, W -114.00941	Stand 5 m north of the northmost pole & shoot south along both nets 4 & 5
5	N 51.02451, W -114.00933	Stand at junction of trail to Nets 14-17-18 & shoot north along both nets 5 & 4
7	N 51.02435, W -114.00964	Stand at junction of main trail & shoot north
8	N 51.02407, W -114.01077	Stand 7 m south of the southmost pole & shoot north to show both nets & pond
10	N 51.02420, W -114.01065	Stand with back to pond & shoot west towards fence
13 & 12	N 51.02424, W -114.00954	10 m to north of stairs along top of bank, next to a large cottonwood; most of the island & nets 13 & 12 should be in the photo
15	N 51.02409, W -114.01007	Stand 5 m east of the eastmost pole, next to a large cottonwood tree & shoot west towards the pond
16	N 51.02317, W -114.01099	Stand with back towards the banding shed
19	N 51.02374, W -114.01098	Stand with back towards the banding shed
Old channel	N 51.02360, W -114.01083	Stand at site of old dam near banding shed, looking north towards Nature Centre & include both sides
West Side	N 51.02410, W -114.01038	Stand on channel edge with back to large cottonwood tree & net 15; shoot across the channel to include both nets 8 & 10, & a panorama including up- and down-stream
East Side	N 51.02420, W -114.01065	Stand on channel edge with back to net 10 & shoot across the causeway towards net 15 & a panorama including up- and down-channel





20240822-net16-IBO



20240822-net19-IBO



20200526-net8-IBO



20200526-net10-IBO



20240822-nets8-10-from-new-causeway-IBO



20200526-pond-panorama-IBO



20240822-habitat-from-near-banding-shed-after-causeway-built-IBO





20240822-east-side-habitat-from-new-causeway-IBO



20200526-net15-IBO



20200526-net7-IBO



20200526-nets13-12-IBO



20200526-net5-IBO



20200526-net4-IBO



20250507-net3-IBO



20200526-net1-IBO

**Nets 14, 17 and 18 (pictured below) are no longer in use as of spring 2024.**



20200526-nets17-18-14-IBO

## **APPENDIX C – Working Alone Policy**

Banders in Charge that might work alone must complete a Registration Form and provide it to IBS. If and when required, please use the following process when working alone.

When you arrive at the park for the beginning of your shift call Corporate Security (403-268-8868) to let them know you are working alone. Provide them with the following information:

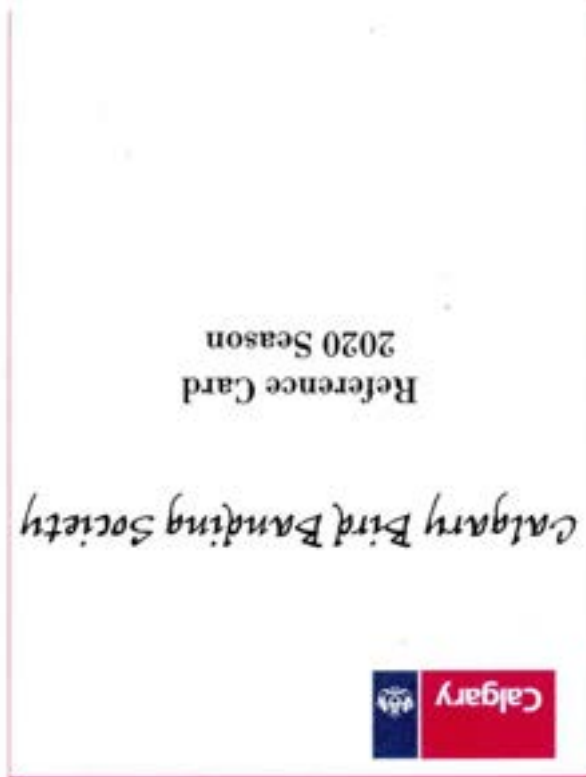
- Name
- Role: Inglewood Bird Banding Volunteer
- Location: Inglewood Bird Sanctuary (2024 Sanctuary Rd SE)
- Shift start & shift end times
- Primary number you can be reached at (personal cell phone) ... and keep your phone on!!

At the end of your shift, call Corporate Security again (403-268-8868) to let them know you are finished.

**It is very important to call and check out.** If they do not receive your check out within a 15-minute period after the end of your shift, they will attempt to reach you. If they cannot get confirmation of your safe return, they will send staff out, including Calgary Police and Calgary Fire.



## APPENDIX D – Inglewood Bird Sanctuary Example Safety Card (folds in middle)



NAME	SITUATION	ACTION	PHONE
LEVEL I EMERGENCY	All life-threatening injuries	Give precise location from Sanctuary Rd	9-1-1
LEVEL II EMERGENCY	Non life-threatening injuries	Police Services	403-266-1234
Bylaw or Peace Officers	Encampments	Give general location - do not enter	3-1-1
Nature Centre	Front Desk/ Park staff	Call or email bee@calgary.ca	311 when closed 403-266-1988
Mantis Eaten	Volunteer Supervisor	Park Liaison	403-861-3731 marie.eaton@calgary.ca
Corporate Security	Working Alone at Inglewood	Call at start & end of shift	403-266-8888
City Media Relations	Media requests		403-828-2954
Bird Alert	Rare sightings		403-308-1067

**Contact List**

### Information & Reminders

- Walker House and alarm code is **1435**.
- Wear your nametag while in the Natural Reserve.
- Additional First Aid Kits are located in the Walker House Volunteer room (behind door).
- Be discreet at all times including entering and exiting the Reserve. Ensure all gates are locked behind you.
- The maximum is 4 including bander in charge and volunteers in the reserve at one time. Stay in eyesight of each other.
- Work Alone Policy is in effect – if you are working alone call before and after your shift.
- Politely ask people who have wandered into the Reserve to return to the trail.
- Stay on existing trails at all times.
- Pathway (Sanctuary Road) speed limit is 20 km/h.
- Only 1 vehicle parked on the pathway. Please park away from the gate.

### **SAFETY IS THE BOTTOM LINE**

Do not touch needles, glass, sharp objects or condoms. Highlight area with visible flag / marker to ensure other Banders can avoid hazard. Report location to Park staff for removal.

Report all encampments to 311 to alert Peace Officers and Park staff.

Report all dead birds to Park staff for pick up. Do not touch! (We are always on the lookout for avian diseases).

Disinfect table, equipment and hands before eating.

Do not enter into conflict with visitors. If you feel unsafe remove yourself from the area.

*Thank you for contributing to the knowledge about Birds in the Sanctuary!*

## **Appendix E – Calgary Bird Banding Society Code of Ethics**

**1. Members are jointly responsible for the safety and welfare of the birds they capture and study. Stress, injuries and mortalities must be minimized. The following guidelines must be adhered to:**

- handle each bird carefully, gently, quietly, and with respect,
- capture only as many birds as you can safely process,
- close traps or nets when predators in the area result in unacceptable risk to bird safety,
- do not open nets in inclement weather,
- assess the condition of nets frequently and repair or replace them quickly,
- members must be properly trained and supervised,
- check nets at least every 30 minutes,
- close and properly furl all nets at the end of each banding day,
- do not double bag birds,
- use the correct band size and banding pliers for each bird, and
- treat all bird injuries in the most humane way.

**2. Members must continually assess their own work to ensure that the highest standards possible are maintained. The following guidelines must be adhered to:**

- reassess methods and your approach whenever an injury or mortality occurs, and
- accept constructive and positive criticism from your peers.

**3. Members must offer honest and constructive assessment of other members work to help develop and maintain the highest standards possible. The following guidelines must be adhered to:**

- provide criticism to other members in a constructive and positive manner,
- inform members and others of innovations and improvements in capture, handling and banding techniques, and
- any mistreatment of birds or improper conduct by a member must be reported to the BIC and/or a member of the CBBS executive.

## **Appendix F – Data forms**

# Daily Log

Calgary Bird Banding Society  
Inglewood Bird Observatory

Date: 18 May 2018  
Bander: Doug Colclister  
Volunteers: Hank Klassen  
Mike Potter

## Bird Migration

Light

## Bird Injuries and Mortalities

Recaptured SOSP with broken leg - appears caught by  
band resulting in excess torque on leg.

## Non-avian Fauna and Flora

Beaver comes upstream and around outside of  
outflow.

Wink foraging on beaver dam near station

## Management of the Station

original signed  
signed (BIC)

**Net Log**  
**Calgary Bird Banding Society**  
**Inglewood Bird Observatory**

Net	Open	Close	Hours	Minutes	Hours.tenths
1	550	1135	5	45	5.8
4	550	1135	5	45	5.8
5	550	1130	5	40	5.7
7	545	1130	5	46	5.8
8	545	1130	5	45	5.8
10	545	1130	5	45	5.8
12					.
13					.
14					.
15	545	1130	5	45	5.8
17					.
18					.
Total					40.5

Date 18 May 2018

Notes

*River very high*  
*Nets 12-14, 17+18*  
*inaccessible.*

**Time Decimal Approximations**

1	0.0	20	0.3	39	0.7
2	0.0	21	0.4	44	0.7
3	0.1	26	0.4	45	0.8
8	0.1	27	0.5	50	0.8
9	0.2	32	0.5	51	0.9
14	0.2	33	0.6	56	0.9
15	0.3	38	0.6	57	1.0

Weather			
	Wind	Temp	% cloud cover
opening		7°	100
midpoint		5°	100
close		10°	80

*original signed*  
 signed (BIC)



**Calgary Bird Banding Society - Ingleswood Bird Observatory**  
**Daily Totals**

Banner-in-Charge Shenna McLeod

Date May 24, 2018

Species	NB Disp 1	Disp 9 or 0	Daily Total	Recaptures			Daily Total	Species	NB Disp 1	Disp 9 or 0	Daily Total	Recaptures			Casual
				?	SD	SY						?	SD	SY	
Canada Goose								Crow							
Wood Duck								Bald Eagle							1
Oakleaf								Sharp-shinned Hawk							
Mallard								Cooper's Hawk							
Blue-winged Teal								Swainson's Hawk							
American Wigeon								Red-tailed Hawk							
Lesser Scaup								Great Horned Owl							
Herring Gull								Belted Kingfisher							
Common Goldeneye								Yellow-bellied Sapsucker							
Hooded Merganser								Downy Woodpecker							
Common Merganser								Hairy Woodpecker							
Ring-necked Pheasant								Northern Flicker							
Pied-billed Grebe								American Kestrel							
Rock Pigeon								Merlin							
Sparrow								Olive-sided Flycatcher							
American Coot								Western Wood Pewee							
Killdeer								Traill's Flycatcher							
Spotted Sandpiper	2	2	2					Least Flycatcher	1		1				
Solitary Sandpiper								Empidonax spp							
Lesser Yellowlegs								Flycatcher spp							
Greater Yellowlegs								Eastern Kingbird							1
Sandpiper spp								Blue-headed Vireo							
Wilson's Snipe								Warbling Vireo						1	1
Franklin's Gull								Red-eyed Vireo							
Ring-billed Gull								Vireo spp							
California Gull								Blue Jay							
Herring Gull								Black-billed Magpie							2
Gull spp								American Crow							3
Common Loon								Common Raven							
Double-crested Cormorant								Tree Swallow							12
American White Pelican								N. Rough-winged Swallow							
Great Blue Heron								Bank Swallow							

Species	NB Disp 1	Disp 9 or 0	Recaptures				Daily Total	Casual
			7	SD	Y-Y	SY		
White-crowned Sparrow								
Dark-eyed Junco								
Sparrow sp.								
Belted Oriole								
Red-winged Blackbird								
Brown-headed Cowbird								
Rusty Blackbird								
Brewer's Blackbird								
Common Grackle								
Blackbird sp.								
Ovenbird								
Northern Waterthrush								
Black-and-white Warbler								
Tennessee Warbler								
Orange-crowned Warbler								
Nashville Warbler								
Connecticut Warbler								
MacGillivray's Warbler								
Mourning Warbler								
Common Yellowthroat								
American Redstart								
Magnolia Warbler								
Bay-breasted Warbler								
Yellow Warbler	/	/						
Blackpoll Warbler								
Palm Warbler								
Yellow-crowned Warbler								
Townsend's Warbler								
Black-throated Green Warbler								
Canada Warbler								
Wilson's Warbler								
Warbler sp.								
Western Tanager								
Rose-breasted Grosbeak								
TOTALS	8	5	13	1	0	2	1	4 49

Species	NB Disp 1	Disp 9 or 0	Recaptures				Daily Total	Casual
			7	SD	Y-Y	SY		
Clay Sparrow								
Barn Swallow								
Swallow sp.								
Black-capped Chickadee								
Red-breasted Nuthatch								
White-breasted Nuthatch								
Nuthatch sp.								
House Wren	/	/			/		/	
Golden-crowned Kinglet								
Rufy-crowned Kinglet								
Townsend's Solitaire								
Veery								
Swainson's Thrush	/	/		/			/	
Hermit Thrush								
American Robin								
Varied Thrush								
Gray Catbird								
Brown Thrasher								
European Starling		4		4				
Cedar Waxwing	/	/						
House Sparrow								
House Finch								
Purple Finch								
Pine Siskin								
American Goldfinch								
American Tree Sparrow								
Chipping Sparrow								
Gray-colored Sparrow								
Savannah Sparrow								
Fox Sparrow								
Song Sparrow								
Lincoln's Sparrow	/	/		/			/	
Swainn Sparrow								
White-throated Sparrow								
Harris' Sparrow								

Location: Inglewood Bird Observatory										Bander-in-Charge: Shanna McLeod					Date: May 24, 2018				
Band Disp	Band Size	Band Number	Species	Age	How	Sex	How	Wing mm	Mass gm	Skull mm	Body Mount Y/N	Fat	CP	BP	Net run	Time banded	Net Scribe	Notes	
1	0	23203897740WR	5	1	U			53	10.0		N	0	N	N	600	630 18	HPK	PB not emerged yet	
1	0	784EFL	1	1	U			62	9.8		N	0	N	N	930	950 7	HPK		
1	0	794EWA	5	1	M	1		60	9.3		N	0	N	N	1000	1020 7	HPK		
1	1B	26619963354TM	5	1	U			96	28.2		N	2	N	N	530	600 7	HPK	7 waxy tips	
1	1B	34CEDW	1	1	M	1		98	53.5		N	0	N	N	730	805 15	HPK		
1	1B	355PSA	1	1	U			107	52.3		N	0	N	N	730	810 14	HPK		
1	1B	365PSA	1	1	U			98	51.6		N	0	N	N	730	815 14	HPK		
1	1	25219300241SP	5	1	U			56	12.9		N	0	N	N	530	555 10	HPK		





## **Appendix G – CBBS Bird Safety Protocol, 2020.03.25**

Our objective is to minimize injury to, and mortality of, birds that we capture and handle during our monitoring projects. The following principles guide us in this regard:

1. Nets are checked a minimum of every 30 minutes, or every 15-20 minutes during periods of colder or hotter temperatures, or during light mist, or otherwise deemed appropriate by the Bander-in-Charge (BIC), and left alone between visits. This minimizes injury rates, while maximizing capture rates.
2. Birds are placed in separate bags and kept near the bander. This may be in the shade if it is hot, or sometimes in weak sunlight during cooler temperatures. Birds that are extremely active in the bag, jumping and struggling constantly, will be elevated in priority.
3. When, in the judgement of the BIC, sustained winds or frequent strong wind gusts result in inefficient capture or endangers the safety of captured birds, all affected nets will be closed.
4. The nets are closed if mist or rain is heavy enough so that water droplets collect on the mesh of the net, if feathers stick to the fingers during extraction, or otherwise deemed appropriate by the BIC.
5. If a predator is noticed in the vicinity of a net the BIC may decide to: 1) check the net more frequently to deter predation, 2) raise the bottom panel higher than normal so that captured birds are not accessible, or 3) close the net.
6. Ambient air temperature should be above 0°C for the nets to be opened.
7. Birds will be kept in holding bags for the minimum amount of time necessary, and not to exceed one hour.
8. If the capture rate has the potential of exceeding the above, the bander will minimize the amount of data that is collected, focusing on just the basics of species, age and sex, in order to process birds more quickly. In extreme cases birds may be released at the net (unbanded if necessary) with only species and obvious age and sex recorded. Nets should be closed as emptied and re-opened only when the BIC feels it is safe to do so.
9. All “red flag” species (see list below) are identified with coloured pegs attached to their bags so they are processed first from that net run. These are birds that warrant closer monitoring (more prone to hypoglycemia, stress, hypothermia, net entanglement, tonguing). These species should also be a priority for extraction if there are multiple birds in a net. Birds that have been tangled badly or otherwise are suspected to be “in trouble,” and are capable of flight, may be released at the net with only species and obvious age and sex recorded.
10. During breeding season, all birds suspected of being associated with a known nest site should be released in the vicinity of the net where they were captured.
11. Only the BIC may cut a net to help extract a badly tangled bird.
12. All hummingbirds are released immediately at the net and recorded in the day’s data.
13. All volunteers are given as much independence to extract birds as the BIC deems appropriate.
14. Volunteers radio the BIC for help if an extraction appears to exceed their ability.
15. Trammel lines are kept taut.
16. Minor holes and tears in nets are repaired the same or next day. Nets sustaining major damage are replaced.
17. A recovery box, with the option of heat pack and sugar water, are available for birds that appear stressed (shivering, lethargic, cold, wet) or who don’t fly immediately upon release (sometimes evidence of wing strain). If a heat pack is used it is wrapped in a small piece of fleece so that it does not directly contact the bird.
18. The use of the recovery box is recorded in the Injuries and Mortalities section of the Daily Log.

19. A bird first aid kit is kept in the banding box, including heat packs, sugar water, veterinarian blood stopper gel, and splinting material (tape, vet wrap, toothpicks). Blood stopper gel is applied to wounds that are bleeding. If a bird cannot be taken to AIWC (see below) or similar wildlife rehabilitation centre, broken legs should be splinted in a flexed position (similar to a perching bird). Dislocated legs that have been reduced may also be splinted.
20. Injured or ill birds that are not immediately considered terminal but that cannot be released will be taken to the Alberta Institute for Wildlife Conservation (AIWC; ph: 403-946-2361), unbanded (unless a recapture).
21. If a bird is euthanised the only acceptable means is by cervical dislocation (see attached methods from New York State Department of Environmental Conservation 2004).
22. When a bird dies all normal data will be collected as well as suspected cause and any contributing factors. Record in the Notes field on the data sheet and bring forward to the Injuries and Mortalities section of the Daily Log.
23. In the event of a mortality or injury necessitating euthanasia, the body will be disposed of in a sanitary manner.

“Red flag” or “sensitive” species:

- American Robin
- *Empidonax* flycatchers
- House Wren
- Ruby-crowned Kinglet
- hummingbirds (always released at net unless additional first aid or holding is deemed necessary)
- any bird that was badly tangled, injured or shows signs of stress
- species listed under the Species at Risk Act (SARA)

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## **Cervical Dislocation**

This method is commonly referred to as "breaking the neck" but would more accurately be described as "snapping the spine." The goal is to quickly separate the spinal cord from the brain to provide a fast and painless death. The separation must take place at the base of the brain or within the upper third of the neck (the cervical spine area).

Cervical dislocation is used primarily for small to medium-sized birds (duck sized or smaller) and small mammals, such as mice and rabbits. To snap the spine of a pigeon or duck-sized bird, grasp the base of the bird's skull in one hand and its body (usually at the base of the neck) in the other hand. Pull hard and fast—twist your hands in opposite directions.

Another cervical dislocation technique for birds uses pliers or vise grips. For smaller birds (up to 11 oz., about the weight of a pigeon), hold the bird in one hand, and a pair of needle-nose pliers in the other. Place the open pliers over the bird's neck vertebrae (in the cervical spine area). Slide the pliers up the neck until they contact the head and are directly over the first and second vertebra in the top of the neck, which support the skull (the atlas and axis vertebra). Then close the pliers firmly and hold for 2–5 seconds.

For larger birds (12 oz.–3 lbs., the upper limit is about the weight of a gull): Hold the bird in one hand, and a pair of square-jawed vise grips in the other. Adjust the vise grips so its jaws will slide over the bird's neck but not over its head. Then slide the vise grips up to the base of the bird's head. With your other hand, pull the bird's body quickly, to snap its spine (separating the cervical vertebrae from the skull).

To snap the spine of a small mammal or larger bird, put it on a hard, flat surface. Hold a strong stick or metal rod firmly against the base of the animal's skull. Pull its body away from its head in a single, steady motion. Keep the stick in place, then bend the body over the head.



## Appendix H – Guide to first aid for birds injured during banding projects

### If you suspect a bird is not healthy consider the following:

- Is it lethargic, depressed, fluffed up?
- Can it fly?
- Is it emaciated, thin? Feel the keel – it should be rounded. If it is concave, the bird should be **sent to AIWC**.
- Does it have a head or eye injury? Are its pupils responsive? Is the head tilting?
- Is it lame? Can it stand? Is balance an issue?
- Is a fracture or dislocation apparent?
- Is it heavily infested with ectoparasites (lice, maggots, blowflies, *hippoboscids* flies)?
- Is it gasping or otherwise seeming to struggle for breath?
- Is it bleeding? Is there discharge from cloaca, ears, nares?
- Is the crop compacted?
- Is there a bad smell associated with the bird?
- Is it dehydrated? Is the skin turgid? Are eyes sunken? Do mucous membranes appear dry and/or pale?
- Can it grip with its feet?

### First aid suggestions and when to send to Alberta Institute for Wildlife Conservation (AIWC) (403-946-2361)

#### Dehydration

If a bird seems dehydrated offer it water with a syringe or droplets on a fingertip. If necessary, place it in a box and allow it to rest for up to a half hour. If the bird does not freely fly away within half an hour **send to AIWC** (preferably un-banded) for assessment and potential treatment.

#### Abrasions and Cuts

Clean cuts and abrasions with water and assess. If wound seems serious and/or requires sutures **send to AIWC** (preferably un-banded) for assessment and potential treatment. Cover the wound with non-stick gauze and hold in a darkened box for pick-up.

#### Fractures and dislocations

Keep broken bone wet, tuck exposed ends under skin. Wrap and immobilize, stabilize joints above and below the fracture. Use vetwrap, non-stick gauze, non-stick tape. Be careful not to restrict circulation. If wrapping a wing be careful not to constrict the patagium. **Send to AIWC** (preferably un-banded) for assessment and potential treatment.

#### Wing Strain (i.e. inability to fly)

This is a non-specific term. A serious cause is a fractured or displaced coracoid. In many other cases, a half hour of rest in a darkened box is all that is needed. If the bird does not freely fly away within a half hour **send to AIWC** (preferably un-banded) for assessment and potential treatment.

#### General Malaise

If a bird does not evidence specific symptoms but still seems to be unhealthy and/or weak, place it in a darkened box. If the bird does not freely fly away within half an hour, **send to AIWC** (preferably un-banded) for assessment and potential treatment.