

Standard Operating Procedure (SOP) 3: Training, Version 1.0

Protocol for Monitoring Brown Bears

Arctic (ARCN) Inventory and Monitoring Network

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The main Narrative for the Protocol for Monitoring Brown Bears in Arctic (ARCN) Inventory and Monitoring Networks is available from the NPS Inventory and Monitoring Arctic Network website (<http://science.nature.nps.gov/im/units/arcn/>) and the Natural Resource Publications Management website (<http://www.nature.nps.gov/publications/nrpm/>)

SOP 3 – Training

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Revision History Log:

Previous Version #	Revision Date	Author	Changes Made	Reason for Change	New Version #
Add rows as needed for each change or set of changes associated with each version.					

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SOP 3.0 – Introduction

This SOP describes the annual training procedures required for personnel involved with Brown Bear monitoring for the Arctic Inventory and Monitoring Network (ARCN). This SOP has been adapted from Thompson et al. (2010) and is heavily based on Rattenbury et al. (2017). Training is carried out well in advance of the upcoming field season and should be completed by the middle of April if possible. Survey and data processing/management personnel will be familiar with the Brown Bear protocol narrative and SOPs. Survey personnel will complete safety training as well as data collection training to comply with quality assurance protocols. Safety is the most important aspect of conducting aerial surveys for monitoring brown bears because aerial wildlife surveys are one of the more dangerous forms of fieldwork for wildlife biologists (Sasse 2003). With this in mind, survey operations will be conducted with safety as the top priority in decision making processes. The Department of the Interior (DOI) Office of Aviation Services (OAS) (<https://www.doi.gov/aviation>) manages use of both DOI (fleet) and contracted (vendor) pilots and aircraft within the National Park Service (NPS), and it provides pilot training and safety certification for these aircraft and pilots.

SOP 3.1 – Safety Training

To ensure crew safety, the NPS requires a high degree of training before crew members are allowed into the field. Each crew member must be able to show that they possess current certification in the classes listed under SOP 3.1.1. These training requirements do not pertain to vendor pilots who are required to have training and certification specific to their OAS contracts with DOI (see SOP 3.1.3). All crew members should be familiar with the Project Aviation Safety Plan and flight following procedures prior to starting survey flying (see Appendix SOP 1.1).

SOP 3.1.1 – Required Safety Training

- 1) Aircrew Member (comprised of A-100 [Basic Aviation Safety; formerly B-3, Basic Airplane and Helicopter Safety], A-116 [General Awareness Security Training], and A-200 [Mishap Review]). These classes are for people who have not had previous aviation safety training. Personnel who participate in Special Use flight activities (e.g., flights lower than 152 m [500 ft] Above Ground Level [AGL]) or who function as Aircrew Members (e.g., observe, photographer, radio tracker, survey recorder) must take these classes before flying. **It is preferred, however, that** observers take all the modules for Aircrew Member with Hazmat (A-110 [Aviation Transportation of Hazardous Materials] in addition to A-100, A-116, and A-200). DOI employees, except USGS, are required to take their initial A-100 training in the classroom. Class schedules and locations can be found at <http://www.iat.gov>.
- 2) Aircrew Member Refresher: Employees who have completed the “Aircrew Member” training or the Basic class are required to take a refresher class every 3 years. The Aircrew Member Refresher may be completed online at <http://www.iat.gov>. A-100, 1-116, and A-200 are required for the online refresher course, however, **it is preferred that observers also take A-110** (Aviation Transportation of Hazardous Materials) as well:

1. A-100 Basic Aviation Safety

2. A-116 General Security Awareness Training
3. A-200 Mishap Review
- 3) Bear and Firearms Safety Training (4 hours, annually). The bear safety portion of the class is required of all NPS field personnel and volunteers. The firearms (shotgun) training is not required of personnel who are not required to carry firearms in the field (observers on the bear surveys are not required to carry firearms).
- 4) A Fixed-Wing Flight Manager – Special Use is required on-site for any projects with special-use flights which includes the < 500' survey flying for the bear surveys. A list of training requirements and opportunities for this position are available through <http://www.iat.gov>. The Fixed-Wing Flight Manager can be an observer on the survey as well.

SOP 3.1.2 – Additional Safety Training

- 1) CPR/First Aid (4 hours). Basic CPR and First Aid is required for all NPS personnel going into the field. A wilderness first aid course is even better.

The project managers must have a basic understanding of aviation management including the use of personal protection equipment (PPE), aircraft contracting, and pilot flight time and duty time limitations. PPE should be available for all persons who fly in the aircraft. The project managers will review the following Department of Interior Manuals and Handbooks:

- Departmental Manual (DM) Parts 350-354 - Aviation Management
- Aviation Life Support Equipment (ALSE) Handbook

SOP 3.1.3 – Pilots' Safety Training

Survey pilots and planes will be required to possess a current Office of Aircraft Services (OAS) certification. Ensure pilots have this certification prior to scheduling them for a survey and have observers check their OAS cards and expiration dates at the start of each survey. Pilots with an OAS certification have taken additional training and flight exam specifications that are more restrictive than FAA requirements for commercial pilots and therefore have met all other required government certifications and requirements. Local OAS contract (vendor) aircraft and pilot sources can be found at <https://sites.google.com/a/ibc.doi.gov/aviation-resources/?pli=1> under the Aircraft and Pilot Resource tabs.

SOP 3.2 – Survey Technique and Protocol Review

Effective training of crew members is the single most important component of maintaining a viable and effective long-term monitoring program. Having properly-trained personnel (pilots and observers) reduces inter-observer error, helps to streamline sampling in the field, reduces sampling errors and ensures that the assumptions of the sampling method can be met. Being able to properly collect data, use equipment, troubleshoot equipment malfunctions and complete the data collection are essential to the Brown Bear monitoring effort. The project managers are

committed to developing a high quality training program that ensures observers are competent and confident during survey flights and data collection and will guarantee the safety and success of the project.

SOP 3.2.1 – Pilot, Observer and GIS Technician Briefing

The project manager(s) will conduct a pre-survey briefing for all observers and GIS/data technicians participating in the survey and for those pilots who have not been involved in an aerial bear survey in the last two years or those wanting a refresher. The project manager(s) should distribute copies of SOP 6 to all pilots, copies of SOPs 1, 3, 5, and 6 to observers, and copies of SOPs 1, 2, 3, 4, 5, 6, 7, and 8 to GIS/data technicians prior to the briefing. The briefing should be scheduled as a two-hour to half-day meeting conducted in person or via video or telephone conference. It should include a short presentation followed by discussion covering the purpose of the Brown Bear survey, procedures for survey flying, data collection, flight following, and data downloading.

The project manager will first review survey flight procedures with pilots, observers and GIS/data technicians. The review will stress the importance of flight procedures that minimize disturbance to surveyed bears and other wildlife. This is of particular importance to the ARCN Brown Bear methodology and statistical model assumptions that require bears to be accurately recorded at their initially observed locations.

Observers and GIS/data technicians should receive training in identifying bear species, the different age classes of bears, and types of bear groups (e.g., sows with yearlings versus sows with two year olds versus mating pairs, etc.), survey equipment setup, data collection and flight following procedures. They will need to practice using the survey equipment by driving training transects in town (SOP 3.2.2). GIS/data technicians participating in the survey should also review SOPs 2, 4, 6 and 7 with the project manager(s) in a separate meeting prior to the surveys.

SOP 3.2.2 – Hands-on Data Collection Training for Observers and GIS/data technicians

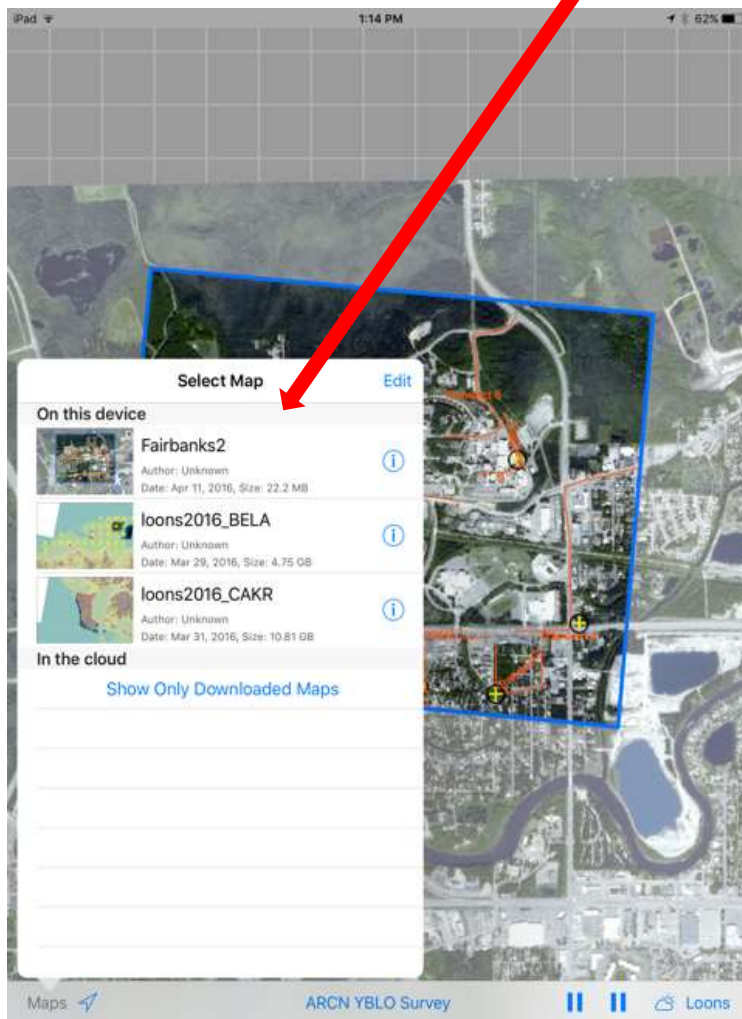
Observers will be trained in bear identification and search images for brown bears and dens from the air; the use of the iPads, GPS units, cameras, field computers and datasheets (SOP 6); data downloading (SOP 7); and flight following using the satellite phone – cell-set system in the aircraft. A training presentation such as O:\Monitoring\Vital Signs\Brown Bears\Training\ARCN_BrownBear_Training.pptx gives an overview of brown bear species identification and highlights key features and instructions for different survey equipment. Also, document O:\Monitoring\Vital Signs\Brown Bear\Training\PROTOCOLS FOR 20xx BROWN BEAR SURVEY.doc outlines generic protocols for the survey that can be updated each year.

The project manager(s) will then demonstrate use of the following data collection equipment and procedures.

- Garmin GPS unit setup (e.g., pilot's Garmin 296/496, SOP 4)
- iPad and external GPS (if it will be used, Garmin 18x) unit setup (SOPs 2)
- Using the Park Observer on the iPad (SOPs 2 and 6)
- Datasheet protocols (SOPs 6)

- Downloading data from the iPad and Garmin GPS units (SOP 7)
- Checking/editing/fixing errors with the data in ArcMap (SOP 8)

Once the observers/GIS/data technicians are familiar with the GPS unit, camera and iPad setup in the office setting, they will use this equipment to collect fake data while riding in a car on street-based transects generated for training in Fairbanks or Kotzebue. ArcMap projects and iPad survey files (SOPs 3 and 6) have been created for data collection training by car in Fairbanks and these can be accessed in separate folders in the following location: **O:\Monitoring\Vital Signs\Brown Bear\Training\ARCN_Brown Bear_Training.pptx**. The screenshot below shows the iPad Park Observer interface and training map around Fairbanks (this example is from Yellow-billed loons training, which is done similarly).



Each observer/GIS technician in training will have an iPad and GPS unit for the day and copies of the protocol instructions from SOP 6 and paper data sheets. The project manager will assist them to connect their iPads to the external Dual GPS unit (if used) and to initiate a survey within Park Observer on the iPads (SOP 2 and 6). The project manager will then drive towards the first street transect. As the training vehicle approaches the transect, the project manager or another observer with some bear survey experience will guide the observers and GIS/data technicians to use the Park Observer to select maps, select a protocol, then create a survey (datasheet) and collect data (SOP 6) that is fake. The project manager will call out fake bear observation to the trainees. The observers/GIS/data technicians will follow along using the Park Observer data form on the iPad (SOPs 6) and will also record backup data on the paper data sheets (SOPs 6). They will add fake weather data for various scenarios (different age, pairs, dens, etc.) (SOPs 6). The observers/GIS/data technicians will also practice editing (SOPs 6) in Park Observer on the iPad as well as how to end the day's survey session (SOPs 6). Several practice observations will be recorded until the observers feel comfortable (good motor memory is established) using Park Observer on the iPad.

During the driving training session, it is important for the observers/GIS/data technicians to become familiar with using the data sheet, iPad and Park Observer together as they are moving and collecting data. It's important for observers to practice continuous observation while using the equipment to collect data. Therefore it's possible that they will not be able to spend much time looking out the window during the drive. However, while in the plane it is critical for the observer to be searching for bears at all times while flying in the unit. When the pilot has flown out of the sample unit or in between sample units the observer can focus on data entry or editing in Park Observer on the iPad. The more time spent practicing on using the data sheet, iPad and Park Observer in the car, the easier it will be for the observer to use the combination of data sheet and Park Observer on the iPad when they are searching for bears in the air.

SOP 3.2.3 – Data Downloading

Following the driving portion of the equipment training, the project manager will guide the observers and GIS/data technicians through editing and proofing their data and then downloading their Park Observer data from the iPads (SOP 7) and downloading the Garmin tracklog and waypoints (SOP 7). These tasks are an important part of data processing in the evening following survey flights while in the field.

SOP 3.2.4 – Use of Paper Data Sheets

Training in the use of data sheets will complement the Park Observer training on the iPads and show how and when to use these forms. Brown bear data is recorded both on the iPad using Park Observer and with a paper data sheet. In addition to providing data quality, redundancy provided by the data sheets serve as a backup for data collection should there be technical difficulties with equipment (loss of GPS signal on the iPad, loss of battery power to the iPad, Park Observer freezes or stops working, etc.). The protocol (i.e., iPad data sheet or data form) in Park Observer is set up to be very similar to the data collection on the paper data sheets. Training will emphasize the use of the Park Observer on the iPad as the primary data collection tool and use of the paper data sheets as backup. See also SOPs 6 for data sheet protocols.

SOP 3.3 – Literature Cited

Sasse, D. B. 2003. Job-related mortality of wildlife workers in the United States, 1937-2000. *Wildlife Society Bulletin* 31:1015-1020.

Rattenbury, K. L. and J. H. Schmidt. 2017. Standard Operating Procedure (SOP) 5: Training, Version 1.0. Dall's Sheep Monitoring Protocol. Arctic (ARCN) and Central Alaska (CAKN) Inventory and Monitoring Networks. National Park Service, Fairbanks, Alaska.

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