

Standard Operating Procedure (SOP) 6: Field Equipment Lists, Version 1.0

Dall's Sheep Monitoring Protocol

Arctic (ARCN) and Central Alaska (CAKN) Inventory and Monitoring Networks

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The main Narrative for the Protocol for Monitoring Dall's Sheep, Arctic (ARCN) and Central Alaska (CAKN) Inventory and Monitoring Networks is available from the NPS Inventory and Monitoring Arctic Network website (<http://science.nature.nps.gov/im/units/arcn/>), the NPS I&M Central Alaska Network website (<http://science.nature.nps.gov/im/units/cakn/>) and the Natural Resource Publications Management website (<http://www.nature.nps.gov/publications/nrpm/>).

SOP 6 – Field Equipment Lists

Standard Operating Procedure #6
Version 1.0 (03/01/2017)

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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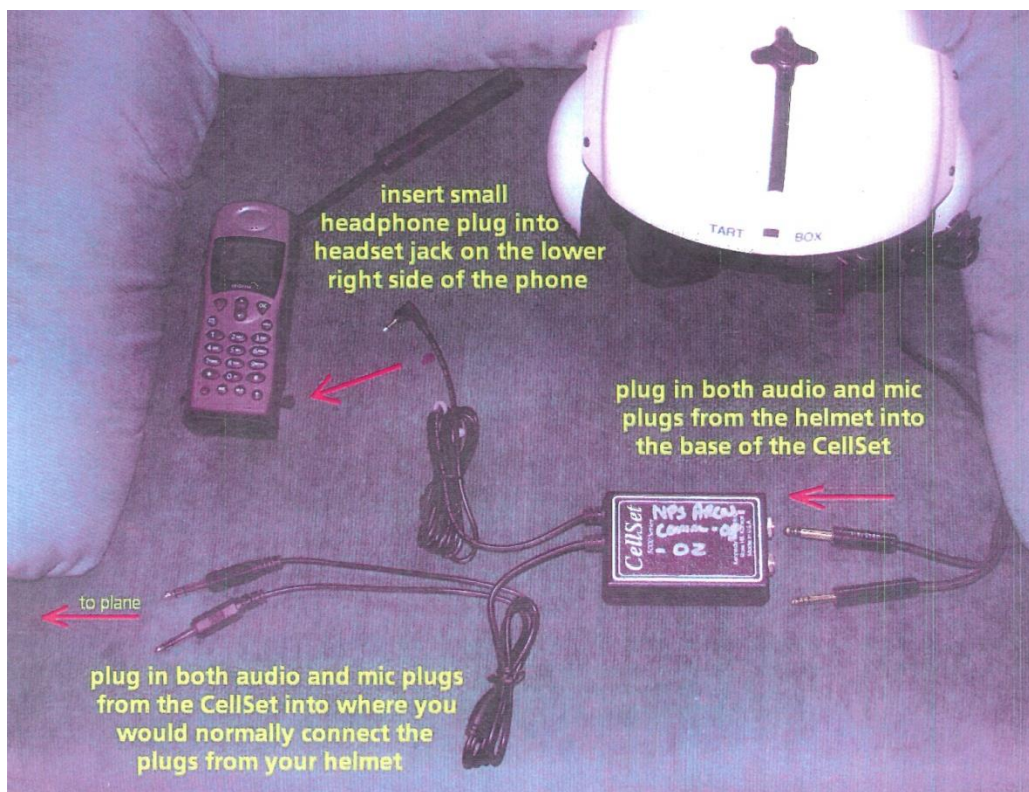
SOP 6.0 – Introduction

SOP 6 is comprised solely of gear lists. SOP 6.1 is an equipment checklist for each plane. The project manager(s) for a survey should ensure that there are enough sets of these equipment for each plane (pilot-observer team) participating in the survey. The project manager(s) must also test all equipment during the pre-season to ensure that they are in working order before sending them to the base airstrips for a survey. SOP 6.2 is a morning checklist for observers. This checklist should be reviewed each morning prior to starting a survey flight to ensure that all equipment is accounted for. This is especially important for equipment that are removed from the plane after the day's flight and brought to the base airstrip housing or office for data downloading and charging in the evening. A copy of both checklists should be given to each observer on a survey.

The following photo shows an observer holding all of the data collection and flight following equipment that must be in the plane for survey flights. Not included in the photo are the external GPS unit that attaches to the field slate, the Garmin 76csx antenna, paper maps, aviation safety plan, paper protocols/cheat sheets for using the field slate, spare warm clothes, rain gear, bug protection and the observer's lunch and water. Additionally, iPads will replace the field slate for data collection in the plane starting in 2016 and are included in the lists below.



The next photo shows the cell-sat setup whereby an observer (or pilot) can attach a satellite phone to the aircraft's radio system for hands-free flight following/satellite communication with dispatch and the outside world.



SOP 6.1 – Equipment Checklist for Each Plane

When staging for an aerial transect survey for Dall's sheep, the project managers should ensure that enough sets of the following equipment list are collected and functioning for each of the planes on the survey. There are some things such as the regular laptop computer kept at the base airstrip that can be shared by observers, although it is more efficient for each observer to have a laptop for data downloading in the evenings. Spare electronics, at least one set per base airstrip, are also recommended.

- **1 iPad (Air2 or similar model) plus:**
 - Power cord - lightning cable and USB wall charger (e.g., Kanex 2.4 amp)
 - Cigarette-lighter charger (USB) and long-leash lightning cable for plane
 - Bluetooth GPS (e.g., Dual Universal GPS Receiver) with cable, chargers
 - 2 external battery packs with cables, chargers (e.g., Kanex 11,000 mAmp)
 - Case/cover for iPad (e.g., Lifeproof)
 - Stylus plus spare
 - Cradle for RAM mount on back of pilot's seat or knee board - optional
- **As backup or instead of an iPad, bring a field slate (xPlore or Toughbook) plus:**
 - Power cord - 2-part wall charger
 - External GPS - Garmin 18x plus spare if available
 - DC-AC adapter/inverter cord (field slate's or iGo) plus spare if available
 - Spare battery for field slate
 - Pelican carrying case
- **1 camera plus:**
 - spare battery
 - spare memory card
 - battery charger – small, plugs direct into outlet
 - white USB download cable – can also use black Garmin cable
 - instruction manual
 - carrying case
- **1 sat phone plus:**
 - instruction manual
 - emergency phone list for park unit
 - external antenna plus adapter arm (normally hooked together in case)
 - cigarette lighter charger – keep in plane in case battery dies
 - 2 spare sat phone batteries
 - wall charger
 - Pelican carrying case
- **1 cell-sat (+ spare 9-volt battery)** – these are normally in your satellite phone case
- **1 regular laptop computer** per base airstrip at minimum plus:
 - spare battery, power cord, mouse, carrying case
- **2 USB memory sticks or external hard drives for data backup/transfer**

- **1 Garmin Map76csx plus:**
 - downloading cable (can use camera's cable for downloading as well)
 - external antenna
 - spare AA batteries
 - Survey topos and transects are loaded as map images on these
- **1 Garmin 296/496 or equivalent for pilot's use** (typically pilots bring their own)
- **1 Garmin 296/496 card for pilot** with survey area topographic maps, transect lines and transect start/end points loaded as map images.

- **1 AFF** if pilot does not have one installed in the plane, Spidertrax, etc.
- **Cigarette-lighter outlet splitter** for plane if needed
- **1 air-to-ground radio** per base airstrip
- **2 sets of paper maps of transect lines** – 11"x17" - one for observer, one for pilot
- **1 wall map** if desired, 24"x36" from plotter per base airstrip
- **2 sets of aviation safety plan and emergency numbers** – one for observer, one for pilot
- **Binder with SOPs/protocols** for the field computer, ArcPad applet, transect flying, downloading data, aviation safety plan and emergency contact numbers
- **Power strip for charging electronics** back at the base airstrip
- **1 large pelican case or action packer for electronics.**
- **1 pair binoculars if desired**
- **1 clipboard**
- **Datasheets**
- **Pencils**
- **Highlighters**
- **Sharpie markers**
- **Duct tape**
- **Electrical tape for antenna cords in plane**
- **Velcro straps for antenna cords in plane**
- **Trash bags**
- **Ziplocks** – gallon and sandwich size for lunches and air-sick bags
- **Paper towels, toilet paper** if needed at base airstrip (remote sites)
- **2 aviation helmets** – 1 is spare
- **1 flight vest or thigh pack with emergency gear**
- **Flight suit or Nomex clothing**
- **1 sleeping bag** if pilot does not have a spare in plane
- **Bug shirt** if desired (head net in flight vest – please return to vest at end of survey)
- **Bug spray** (DEET in vest – please return at end of survey)
- **Leatherman** (there is one in flight vest – please return at end of survey)

- **Fueling kit** (only for base airstrips where fuel drums or barrels will be used) – fuel containment system including berm, poles and stakes; fire extinguisher; hand-, battery- or generator-operated pump system; fuel spill containment barrel and bags; absorbent material pads

SOP 6.2 – Morning Checklist

This list should be kept with the observer's clipboard and datasheets and he/she should ensure each morning during the survey that these equipment make it to the plane for the day's flight. This is not the same as the equipment list for pre-survey packing, which is covered in SOP 6.1. Items in *italics* can be left in the plane overnight. Items in **bold** go back each night to the base airstrip housing for data downloading and electronic charging.

- ✓ **Charged iPad plus:**
 - **Bluetooth GPS (charged)**
 - *Cigarette lighter plug adapter and long-leash USB lighting cable*
 - **2 backup battery packs (charged)**
 - *Stylus*
- ✓ **If not using iPad - charged field computer / field slate, plus:**

*** Important*** load a blank Survey file each morning to the field computer.

 - power cord (2 parts to this) –may not need this if using adapter/inverter
 - *external GPS – Garmin 18x*
 - *DC-AC adapter/inverter (cigarette lighter plug adapter for power cord)*
 - *Splitter for cigarette lighter plug if needed*
 - *Spare battery*
- ✓ **Charged camera plus:**
 - *spare battery*
 - *spare memory card*
 - *instruction manual*
- ✓ **Charged sat phone plus:**
 - *instruction manual*
 - *emergency phone list*
 - *external antenna plus adapter arm - attach to aircraft crossbars at start of survey*
 - *cigarette lighter charger*
 - *1-2 spare batteries*
- ✓ *Cell-sat (+ spare 9-volt battery)*
- ✓ **Garmin Map76csx plus:**
 - *external antenna – attach to aircraft crossbars at start of survey*
 - *spare AA batteries*
 -
- ✓ **Pilot's Garmin 296/496**
- ✓ **Paper maps**
- ✓ **Datasheets on clipboard**
- ✓ **Lunch and water**
- ✓ **Spare warm clothes, rain gear, bug shirt or head net**
- ✓ **Flight suit/Nomex clothing**

- ✓ Pencils
- ✓ Aviation safety plan and emergency numbers – make sure you have one set in the plane before flying. Leave one copy in base airstrip house as well.
- ✓ Protocols for flying transects and computer-ArcPad or cheat sheet
- ✓ Velcro straps and electrical tape for antenna cords in plane
- ✓ Air-sick bags plus paper towels
- ✓ Binoculars
- ✓ Helmet
- ✓ Flight vest
- ✓ Sleeping bag for emergency if pilot doesn't have spare